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Waste Tank Summary Report for Month Ending November 30, 1998

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WASTE TANK SUMMARY REPORT

B. M. Hanlon

ABSTRACT

This report is the official inventory for radioactive waste stored in underground tanks in the 200 Areas at the Hanford Site. Data that depict the status of stored radioactive waste and tank vessel integrity are contained within the report. This report provides data on each of the existing 177 large underground waste storage tanks and 63 smaller miscellaneous underground storage tanks and special surveillance facilities, and supplemental information regarding tank surveillance anomalies and ongoing investigations. This report is intended to meet the requirement of U. S. Department of Energy-Richland Operations Office Order 5820.2A, Chapter I, Section 3.e. (3) (DOE_RL, 1990, Radioactive Waste Management, U. S. Department of Energy-Richland Operations Office, Richland, Washington) requiring the reporting of waste inventories and space utilization for Hanford Tank Farm tanks.

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METRIC CONVERSION CHART		
1 inch	=	2.54 centimeters
1 foot	=	30.48 centimeters
1 gallon	=	3.80 liters
1 ton	=	0.90 metric tons
$^{\circ}\text{F} = \left(\frac{9}{5} ^{\circ}\text{C} \right) + 32$		
1 Btu/h = 2.930711 E-01 watts (International Table)		

WASTE TANK SUMMARY REPORT FOR MONTH ENDING NOVEMBER 30, 1998

Note: Changes from the previous month are in bold print.

I. WASTE TANK STATUS

Category	Quantity	Date of Last Change
Double-Shell Tanks ^c	28 double-shell	10/86
Single-Shell Tanks ^a	149 single-shell	07/88
Assumed Leaker Tanks	67 single-shell	7/93
Sound Tanks	28 double-shell 82 single-shell	1986 7/93
Interim Stabilized Tanks ^{b,d}	119 single-shell	11/97
Not Interim Stabilized ^e	30 single-shell	11/97
Intrusion Prevention Completed ^g	108 single-shell	09/96
Controlled, Clean, and Stable ⁱ	36 single-shell	09/96
Watch List Tanks ^h	32 single-shell 6 double-shell	9/96 ^h 6/93
Total	38 tanks	

^a All 149 single-shell tanks were removed from service (i.e., no longer authorized to receive waste) as of November 21, 1980.

^b Of the 119 tanks classified as Interim Stabilized, 64 are listed as Assumed Leakers. The total of 119 Interim Stabilized tanks includes one tank that does not meet current established supernatant and interstitial liquid stabilization criteria. (See Table I-1 footnotes, item #2)

^c Six double-shell tanks are currently included on the Hydrogen Watch List and are thus prohibited from receiving waste in accordance with "Safety Measures for Waste Tanks at Hanford Nuclear Reservation," Section 3137 of the *National Defense Authorization Act for Fiscal Year 1991*, November 5, 1990, Public Law 101-510.

^d Of the 32 single-shell tanks on Watch Lists, 11 have been Interim Stabilized.

^e Of the 32 single-shell tanks on Watch Lists, 11 have completed Intrusion Prevention (this category replaced Interim Isolation). (See Appendix C for "Intrusion Prevention" definition).

^f Three of these tanks are Assumed Leakers (BY-105, BY-106, SX-104). (See Table H-1)

^g See Section A tables for more information on Watch List Tanks. Eight tanks (A-101, S-102, S-111, SX-103, SX-106, U-103, U-105, and U-107) are currently on more than one Watch List.

^h Dates for the Watch List tanks are "officially added to or removed from the Watch List" dates. (See Table A-1, Watch List Tanks, for further information.)

ⁱ The TY tank farm was officially declared Controlled, Clean, and Stable in March 1996. The TX tank farm and BX tank farms were declared CCS in September 1996. (BX-103 has been declared to have met current interim stabilization criteria, and is included in CCS - see also Appendix I).

II. WASTE TANK INVESTIGATIONS

This section includes all single-shell tanks or catch tanks which are showing surface level or interstitial liquid level (ILL) decreases, or drywell radiation level increases in excess of established criteria.

There are currently no tanks under investigation for ILL decreases or drywell radiation level increases which exceed the criteria. Drywell monitoring is done on an "as needed basis" with the exception of tanks C-105 and C-106 which are monitored monthly.

A. Assumed Leakers or Assumed Re-leakers: (See Appendix C for definition of "Re-leaker")

This section includes all single- or double-shell tanks or catch tanks for which an off-normal or unusual occurrence report has been issued, or for which a waste tank investigation is in progress, for assumed leaks or re-leaks. Tanks/catch tanks will remain on this list until either a) completion of Interim Stabilization, b) the updated occurrence report indicates that the tank/catch tank is not an assumed leaker, or c) the investigation is completed.

There are currently no tanks for which an off-normal or unusual occurrence report has been issued for assumed leaks or re-leaks.

B. Tanks with increases indicating possible intrusions:

This section includes all single-shell tanks and related receiver tanks for which the surveillance data show that the surface level or ILL has met or exceeded the increase criteria, or are still being investigated.

Candidate Intrusion List: Increase criteria in the following tanks indicate possible intrusions; however, no funds were allocated for performing intrusion investigations in FY 1999 due to higher priority work in the area of safe storage.

Tank 241-U-111 has been added to the list. This tank has been experiencing a gradual level increase (about 5 inches) since 1985. The increase appears to be seasonal. There may be an intrusion due to snowmelt as has been observed in other single-shell tanks. Since the intrusion is so small, this tank will be rebaselined, and placed on a list of tanks requiring intrusion investigation.

Tank 241-B-202
 Tank 241-BX-101
 Tank 241-BX-103
 Tank 241-BY-103
 Tank 241-C-101
 Tank 241-U-111

244-AR Tanks and Sumps: Currently, all ventilation systems at 244-AR are shut down. Based on the weight factor gauges for the sumps and tanks, Tank 001 contains 1,300 gallons, Tank 002 contains 12,250 gallons, Tank 003 contains 2,000 gallons, and Tank 004 contains 250 gallons. Sump 001 contains 15.5 gallons, Sump 002 contains 0-2 gallons, and Sump 003 contains 3,300 gallons. There was no change in tank/sump contents as of September 30, 1998. Status of jet pumping: first attempts at jetting were unsuccessful. The next attempt to jet pump may be in FY99, depending on funding.

Catch Tank 241-AX-152: The liquid level in this catch tank was steady around 66.75 inches from the startup of Project W-030, Tank Farm Ventilation System, in March 1998 until late August 1998. The level then began to decrease. The October reading of 65 inches is 1.75 inches below the summer average. This is an active catch tank, routinely pumped, and deviations from baseline are not applicable per OSD-31. The decrease represents a significant change in trend and it is apparent that tank conditions changed around the end of August 1998.

Resolution Status: Discrepancy Report #98-853 was issued on November 4, 1998. One possible cause under investigation is a change in flow path, causing an increase in evaporation. The tank was pumped down to 2.25

inches on November 13. Since that time the level has decreased to 1.00 inch. The Discrepancy Report will remain open and the tank will remain on the alert list until an engineering investigation is complete.

Catch Tank 241-TX-302-C: The ENRAF readings have been gradually decreasing since pumping on April 27, 1998. After the catch tank was pumped, a new baseline of 7.0 inches was established. There has been a gradual decrease from 7.0 to 5.84 inches since that time.

Resolution Status: This tank was rebaselined again with a sloping baseline of 6.14 inches to account for the evaporation.

III. SURVEILLANCE AND WASTE TANK STATUS HIGHLIGHTS

1. Single-Shell Tanks Saltwell Jet Pumping (See Table E-6 footnotes for further information)

Tank 241-C-106 – Waste removal operations were initiated on November 18, 1998. Commencement of sluicing (sludge removal) begins the process of waste removal in the highest heat-generating single-shell storage tank. Wastes from C-106 are being pumped underground through a new specially constructed pipeline to AY-102. The ventilation system for AY-102 is designed for the anticipated heat load of the waste from C-106.

Tank 241-S-109 - The saltwell screen installation is in progress.

Tank 241-SX-104 - Pumping resumed October 7, 1998, and was shut down for several periods during October and November for transfer of waste from the DCRT to SY-102, and to perform an integrity assessment of the DCRT. 14.1 Kgallons were pumped in November; 26,326 gallons of dilution water and 2,435 gallons of water for transfer line flushes were used during November pumping operations. A total of 158.5 Kgallons has been pumped from this tank.

Tank 241-SX-106 – Pumping started on October 7, 1998, and was shut down for several periods during October and November for transfer of waste from the DCRT to SY-102, and to perform an integrity assessment of the DCRT. 1.9 Kgallons were pumped in November; 1,372 gallons of dilution water and 976 gallons of water for transfer line flushes were used during November pumping operations. A total of 11.7 Kgallons has been pumped from this tank.

Tank 241-T-104 - Pumping resumed on June 7, 1998; 3.2 Kgallons were pumped in November. Actual volume of liquid remaining to be pumped is still a rough estimate. Volumes will be adjusted as porosity data becomes available with continued pumping; 362 gallons of raw water were used during November for pumping operations. A total of 142.6 Kgallons has been pumped from this tank.

Tank 241-T-110 - Pumping resumed in July after the pump was replaced; 3.6 Kgallons were pumped in November. Actual volume of liquid remaining to be pumped is still a rough estimate. Volumes will be adjusted as porosity data becomes available with continued pumping; 932 gallons of raw water were used during November for pumping operations. A total of 37.1 Kgallons has been pumped from this tank.

2. Single-Shell Tank TPA Interim Stabilization Milestones

All M-41-xx Milestones are being renegotiated. See also Table I-2, Tri-Party Agreement Single-Shell Tank Interim Stabilization Schedule.

3. Tank Waste Remediation System Safety Initiatives

The U. S. Secretary of Energy has directed that six safety initiatives be implemented in the Tank Waste Remediation System Program to accelerate the mitigation/resolution of the high priority waste tank safety issues at the Hanford Site. Forty-two milestones were established for accomplishing the initiatives.

No Safety Initiatives were scheduled to be completed in November.

The following Safety Initiatives remain to be completed:

SI 4a - Upgrade Alarm Panels in Seven Tank Farms
 SI 4c - Complete Accelerated Walk-Downs and Field Verify Essential Drawings
 SI 6d - Initiative C-106 Accelerated Retrieval

Completion dates for Safety Initiatives 4c and 6d have been missed.

SI 4a - An assessment of the Completion Record is being evaluated for this Safety Initiative.

4. Double-Shell Tank 241-SY-101 Waste Level Increase

Although the waste level in tank SY-101 has risen slowly and steadily since last February, the surface level and hydrogen venting are within safety and operating limits. A mixer pump was installed in the tank in July 1993, which circulates liquid wastes from the tank's upper layer down to the bottom where jet nozzles discharge the fluid about two feet from the bottom. This prevents gas bubbles from building up at the bottom, and results in venting of small steady gas releases, rather than in large infrequent gas releases. Investigations continue on why the surface level is rising.

Several void fraction instrument (VFI) readings have been completed which gives the void fraction at depth in the riser through which it is deployed. The VFI readings indicate that the level increase is due to gas trapped in the crust, which comprises the upper approximately 60 inches of waste. Additionally, core sampling of both retained gas sampling (RGS), and regular cores, is presently in progress.

Resolution Status: On February 11, 1998, the PRC recommended that the DOE-RL declare an Unreviewed Safety Question (USQ) over the continued level growth observed in this tank. The PRC implemented a standing order (SO) that placed operational restrictions on mixer pump operations. The SO released Operations from required actions at waste levels of 402 inches as measured by the Riser IC ENRAF. Riser 1A was rebaselined from 403.65 to 417.5 inches in August, USQ approval #TF-98-0852. Riser 1C has readings of 405.24 inches. DOE has modified the 406-inch and 422-inch mixer pump operational controls to allow additional mixer pump and characterization operations. Tank Farms has implemented TWO Standing Order 99-01 to reflect the relaxation of mixer pump operating controls at 406 and 422 inches. The contractor has established a multi-disciplinary team to solve the level growth issues in SY-101.

5. Characterization Progress Status (See Appendix J)

Characterization is the understanding of the Hanford tank waste chemical, physical, and radiological properties to the extent necessary to ensure safe storage and interim operation, and ultimate disposition of the waste.

Characterization Progress for November:

Characterization sampling efforts were directed towards obtaining solid samples from 241-SY-101 this month. Weather, holidays, and equipment needs delayed this activity throughout the month. Vapor grab samples were obtained from the SHMS cabinets, and a grab sample was taken from S-106 to support characterization.

6. Standard Hydrogen Monitoring System (SHMS)

Gas monitoring systems have been installed on 41 of the underground waste storage tanks including the 25 tanks on the Hydrogen Watch List. The monitors provide essential data to aid in safely managing wastes in the tanks by sampling gases in the air space above the tanks contents, and analyzing the amount of hydrogen. Some newer monitors also analyze the amount of nitrous oxide, ammonia, methane and other flammable gases.

7. PMHC-TANKFARM-1998-0131, Off-Normal Occurrence Report, "Tank SX-104 Dome Deflection Not Performed as Required by Operating Specification Document," Initial Update October 22, 1998.

On October 20, 1998, it was discovered that the tank dome deflection for SX-104 had not been performed as required by Operating Specification Document (OSD), OSD-T-151-00013. The requirement for performing the dome deflection is that a dome deflection survey be performed every $20,000 \pm 5,000$ gallons net jet pump production. Approximately 28,000 gallons had been jet pumped out of SX-104 when this was discovered.

Dome deflection of >0.02 feet may indicate excessive dome loading or possible structural failure. This phenomenon is expected primarily after the pumping, since salt cake encrustations on in-tank equipment could load the domes severely when not buoyed by the interstitial liquid removed during jet pumping. Deflection is defined as a decrease in elevation measurements from the original survey elevation.

On October 21, a critique of this event was held. As a result of this critique, it was decided that this be reported as an Off-Normal Occurrence.

Saltwell pumping of SX-104 has been suspended until the dome settlement survey is completed. (Pumping resumed in November - see also Highlights, page 3, for more current information since this Occurrence Report was issued).

Methods are currently being developed by Interim Stabilization management to ensure this situation does not occur again.

8. PHMC-TANKFARM-1998-0124, Off-Normal Report, "Liquid Observation Well (LOW) Readings in SST 241-B-111 Indicate a Potential Drop in Interstitial Liquid Level," Initial Update October 22, 1998.

Liquid Observation Well (LOW) readings taken on September 29, 1998, of the interstitial Liquid level in SST B-111 were in excess of -3 standard deviations from the baseline established for this tank. Two additional LOW readings were performed on September 30, 1998, to validate the weekly data. The readings taken on September 30 also exceeded the -3 standard deviation criteria required for this tank per OSD-T-151-00031.

Tank B-111 was declared an "Assumed Leaker" in 1978. Interim Stabilization of the tank was completed in 1985.

On October 1, 1998, daily LOW and surface level gauge readings were initiated on the anomalous data.

On October 1, 1998, an operational and engineering review of the anomalous data was initiated.

On October 7, 1998, operations and engineering completed a review of the LOW monitoring equipment, barometric pressure change information and recent tank B-111 activities. This review determined that these factors did not appear to contribute to the anomalous data.

On October 7, 1998, a formal engineering evaluation team was initiated to investigate a potential drop in the ILL for this tank.

On October 20, 1998, the Plant Review Committee (PRC) reviewed the information presented and the consensus recommendations include: 1) Place the tank on the alert list and continue normal monitoring with increased emphasis on surveillance; 2) Re-evaluate if growth 2-sigma deviations from the data of the last 21 days is experienced; 3) Re-evaluate if the level trend is downward 2-sigma deviations.

Pumping activities were evaluated and determined not appropriate at this time.

Tank B-111 appears to be returning to the pre-event trend. Any significant deviations or anomalies noted during surveillance activities of this tank will be submitted in future reports.

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APPENDIX A

WASTE TANK SURVEILLANCE MONITORING TABLES

TABLE A-2. ADDITIONS/DELETIONS TO WATCH LISTS BY YEAR

November 30, 1998

Added/Deleted dates may differ from dates that tanks were officially added to the Watch Lists. (See Table A-1).

	Ferrocyanide	Hydrogen	Organics	High Heat	Total Tanks (1)		
					SST	DST	Total
1/81 Original List -Response to Public Law 101-510	23	23	8	1	47	5	52
Added 2/91 (revision to Original List)	1 T-107				1		1
Total - December 31, 1991	24	23	8	1	48	5	53
Added 8/92		1 AW-101				1	1
Total - December 31, 1992	24	24	8	1	48	6	54
Added 3/93 Deleted 7/93	-4 (BX-110) (BX-111) (BY-101) (T-101)		1 U-111		1 -4		
Added 12/93		1 (U-107)			0		
Total - December 31, 1993	20	25	9	1	45	6	51
Added 2/94 Added 5/94			1 T-111 10 A-101 AX-102 C-102 S-111 SX-103 TY-104 U-103 U-105 U-203 U-204		1 4		
Deleted 11/94	-2 (BX-102) (BX-106)				-2		
Total - December 31, 1994, & December 31, 1995	18	25	20	1	48	6	54
Deleted 8/96	-4 (C-108) (C-109) (C-111) (C-112)				-4		
Deleted 9/96	-14 (BY-103) (BY-104) (BY-105) (BY-106) (BY-107) (BY-108) (BY-110) (BY-111) (BY-112) (T-107) (TX-118) (TY-101) (TY-103) (TY-104)				-12		
Total - November 30, 1998	0	25	20	1	32	6	38

(1) Eight tanks are on more than one list: A-101, S-102, S-111, SX-103, SX-106, U-103, U-105, and U-107; therefore the total of tanks added or deleted will depend upon whether a tank is also on another list.

TABLE A-3. TEMPERATURE MONITORING IN WATCH LIST TANKS (Sheet 1 of 2)

November 30, 1998

All Watch List tanks are reviewed for increasing temperature trends. Temperatures in these tanks are monitored by the Tank Monitor And Control System (TMACS), unless indicated otherwise.

Temperatures are taken in the waste unless in-waste thermocouples are out of service. See footnote (3). Temperatures below are the highest temperatures recorded in these tanks during this month, and do not exceed the maximum criteria limit for this month.

Temperatures in Degrees F.Total Waste in Inches

(Total waste in inches is calculated from Inventory tables and size of tank, not surface level readings)

Hydro/Flammable Gas			Organic Salts			High Heat		
Tank No.	Temp.	Total Waste	Tank No.	Temp.	Total Waste	Tank No.	Temp.	Total Waste
A-101	148	347	A-101	148	347	C-106 (2)	195	72
AX-101 (*) (3)	130	272	AX-102 (*)	78	14	<div>1 Tank</div> <p>Note: Sluicing began November 18, 1998</p>		
AX-103 (*)	111	40	B-103 (*) (3)	68	17			
S-102	104	207	C-102	82	149			
S-111	90	224	C-103	117	66			
S-112	84	239	S-102	104	207			
SX-101	133	171	S-111	90	224			
SX-102	142	203	SX-103	161	242			
SX-103	161	243	SX-106	105	201			
SX-104	148	229	T-111	67	158			
SX-105	167	254	TX-105	97	228			
SX-106	105	201	TX-118	75	134			
SX-109 (1)	141	96	TY-104	67	24			
T-110	65	133	U-103	86	166			
U-103	86	166	U-105	89	147			
U-105	89	147	U-106	82	78			
U-107	79	143	U-107	79	166			
U-108	87	166	U-111	81	115			
U-109	83	164	U-203	64	12			
AN-103	109	348	U-204	64	12			
AN-104	109	384	20 Tanks					
AN-105	106	410						
AW-101 (*)	101	410						
SY-101	122	405						
SY-103	95	270						
25 Tanks								

(*) Temperatures in these tanks are taken manually on a weekly basis.

38 Tanks are on the Watch List (8 tanks are on more than one list: A-101, S-102, S-111, SX-103, SX-106, U-103, U-105, U-107)

All tanks have been removed from the Ferrocyanide Watch List. See Table A-2 for list and dates.

TABLE A-3. TEMPERATURE MONITORING IN WATCH LIST TANKS
(sheet 2 of 2)

Notes:Unreviewed Safety Question(USQ):

There is a USQ currently associated with all single-shell tanks, resulting in special controls required, and limiting the work in the tanks. Pumping is on hold until the DOE-RL approval is received for each tank.

Hydrogen/Flammable Gas:

Tanks which are suspected to have a significant potential for hydrogen/flammable gas generation, entrapment, and episodic release. The USQ associated with these tanks is due of the potential consequences of a radiological release resulting from a flammable gas burn, an event not analyzed in the SST Safety Analysis Report (SAR).

Organic Salts:

Single-shell tanks containing concentrations of organic salts ≥ 3 weight% of total organic carbon (TOC)(equivalent to 10 wt% sodium acetate). The USQ associated with these tanks is because it has been concluded there is a small potential for an organic nitrate accident. Double-shell tanks have >3 weight% TOC but are not on the Watch List because they contain mostly liquid, and there is no credible organic safety concern for tanks which contain mostly liquid.

High Heat:

Tanks which contain heat generating strontium-rich sludge and require drainable liquid to be maintained in the tank to promote cooling. Only tank C-106 is on the High Heat Watch List because in the event of a leak, without water additions the tank could exceed temperature limits resulting in unacceptable structural damage. The tank is cooled through evaporation in conjunction with active ventilation. Water is periodically added as evaporation takes place.

Active ventilation:

There are 15 single-shell tanks on active ventilation (eight are on the Watch List as indicated by an asterisk):

C-105	SX-107
C-106 *	SX-108
SX-101 *	SX-109 *
SX-102 *	SX-110
SX-103 *	SX-111
SX-104 *	SX-112
SX-105 *	SX-114
SX-106 *	

Note: A-104, 105 and 106 exhausters has been out of service since 1991 and is no longer considered actively ventilated. Although C-104 has a cascade line with C-105, it is not considered to be actively ventilated.

Footnotes:

- (1) Tank SX-109 has the potential for flammable gas accumulation only because other SX tanks vent through it.
- (2) Tank C-106 is on the Watch List because in the event of a leak without water additions the tank could exceed temperature limits resulting in unacceptable structural damage.
- (3) There are no in-waste temperatures for tanks AX-102 and B-103. The waste level in these tanks is lower than the lowest thermocouple in these tanks. Temperatures in this table show the maximum in the tanks taken in the vapor space.

TABLE A-4. TEMPERATURE MONITORING IN NON-WATCH LIST TANKS

November 30, 1998

SINGLE-SHELL TANKS WITH HIGH HEAT LOADS (>40,000 Btu/hr)

Ten tanks have high heat loads for which temperature surveillance requirements are established by OSD-T-151-00013. Only one of these tanks (241-C-106) is on the High Heat Watch List. In an analysis, WHC-SD-WM-ER-333, "Evaluation of Heat Sources in High Heat Single Shell Tanks," Bander, 1994, it was determined that six of the ten tank have heat sources greater than 40,000 Btu/h. Additionally, although four tanks have heat loads less than 40,000 Btu/h, it is recommended that these tanks remain on the High Heat Load List because of uncertainties in the parameters used in these analyses. It is estimated that the current analysis predicts the heat loads within +/- 20%.

Temperatures in these tanks did not exceed OSD requirements for this month. All high heat load tanks, with the exception of 241-A-104 and 241-A-105, are on active ventilation. All high heat load tanks are monitored by the Tank Monitor and Control System (TMACS), with the exception of A-104 and A-105, which are taken manually on a weekly basis.

<u>Tank No.</u>	<u>Temperature (F.)</u>	<u>Total Waste In Inches</u>	(Total Waste In Inches is calculated from inventory table and tank size, not surface level readings)
A-104	171	10	
A-105	141	07	
C-106 (*)	195	72	
SX-107	166	43	
SX-108	187	37	
SX-109	141	96	
SX-110	164	28	
SX-111	187	51	
SX-112	149	39	
SX-114	179	71	
10 Tanks			

(*) C-106 on High Heat Load Watch List. Sluicing began November 18, 1998.

Highest temperature in 34 lateral thermocouples beneath A-105: 237

SINGLE SHELL TANKS WITH LOW HEAT LOADS (<=40,000 Btu/hr)

There are 108 low heat load non-watch list tanks. Temperatures in tanks connected to TMACS are monitored by TMACS; temperatures in those tanks not yet connected to TMACS are manually taken semiannually in January and July. Temperatures obtained were within historical ranges for the applicable tank.

No temperatures have been obtained for several years in the tanks listed below. Most of these tanks have no thermocouple tree.

<u>Tank No.</u>	<u>Tank No.</u>
BX-104	TX-101
BY-102	TX-110
BY-109	TX-114
C-204	TX-116
SX-115	TX-117
T-102	U-104
T-105	

TABLE A-5. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS

149 TANKS (Sheet 1 of 6)

November 30, 1998

The following table indicates whether Single-Shell tank monitoring was in compliance with the requirements as specified in the applicable documents as of the last day of the applicable month:

NOTE:

All Watch List and High Heat tank temperature monitoring is in compliance. (4)

All Dome Elevation Survey monitoring is in compliance. (See also footnote 13)

All Psychrometrics monitoring is in compliance (2).

Drywell monitoring is done "as needed" (9).

In-tank photos/videos are taken "as needed" (3)

LEGEND:

(Shaded)	= in compliance with all applicable documentation
N/C	= noncompliance with applicable documentation
O/S	= Out of Service
Neutron	= LOW readings taken by Neutron probe
POP	= Plant Operating Procedure, TO-040-650
MT/FIC/ENRAF	= Surface level measurement devices
OSD	= Operating Specifications Doc., OSD-T-151-00013, -00031
N/A	= Not applicable (not monitored, or no monitoring schedule)
None	= Applicable equipment not installed

Tank Number	Tank Category		Temperature Readings (4)	Primary Leak Detection Source (5)	Surface Level Readings (1) (OSR, OSD)			LOW Readings (OSD)(5,7) Neutron
	Watch List	High Heat			MT	FIC	ENRAF	
A-101	X			LOW	None	None		
A-102				None	None		None	None
A-103				LOW	None	None		
A-104		X		None	None	None		None
A-105		X		None		None	None	None
A-106				None	None	None		None
AX-101	X			LOW	None	None		(10)
AX-102	X			None	None	None		None
AX-103	X			None	None	None		None
AX-104				None	None	None		None
B-101				None	None		None	None
B-102				ENRAF	None	None		None
B-103	X			None	None		None	O/S
B-104				LOW		None	None	
B-105				LOW		None	None	
B-106				FIC	None		None	None
B-107				None		None	None	None
B-108				None	None		None	None
B-109				None		None	None	None
B-110				LOW	O/S	None	None	
B-111				LOW	None		None	
B-112				ENRAF	None	None		None
B-201				MT		None	None	None
B-202				MT		None	None	None
B-203				MT		None	None	None
B-204				MT		None	None	None
BX-101				ENRAF	None	None		None
BX-102				None	None	None		None
BX-103				ENRAF	None	None		None
BX-104			None	ENRAF	None	None		None
BX-105				None	None	None		None
BX-106				ENRAF	None	None		None
BX-107				ENRAF	None	None		None

TABLE A-5. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS

149 TANKS (Sheet 2 of 6)

Tank Number	Tank Category		Temperature Readings (4)	Primary Leak Detection Source (5)	Surface Level Readings (1) (OSD)			LOW Readings (OSD)(5,7) Neutron
	Watch List	High Heat			MT	FIC	ENRAF	
BX-108				None	None	None		None
BX-109				None	None	None		None
BX-110				None	None	None		None
BX-111				LOW	None	None		
BX-112				ENRAF	None	None		None
BY-101				LOW		None	None	
BY-102			None	LOW	O/S	None	None	
BY-103				LOW	None	None		
BY-104				LOW	O/S	None	None	
BY-105				LOW		None	None	
BY-106				LOW		None	None	
BY-107				LOW		None	None	
BY-108				None		None	None	None
BY-109			None	LOW	None	O/S	None	
BY-110				LOW	None	None		
BY-111				LOW	None	None		
BY-112				LOW		None	None	
C-101				None		None	None	None
C-102	X			None	None		None	None
C-103	X			ENRAF	None	None		None
C-104				None	None		None	None
C-105				None	None	None		None
C-106 (3)	X	X		ENRAF	None	None		None
C-107				ENRAF	None	None		None
C-108				None		None	None	None
C-109				None		None	None	None
C-110				MT		None	None	None
C-111				None		None	None	None
C-112				None	None	None		None
C-201				None		None	None	None
C-202				None		None	None	None
C-203				None		None	None	None
C-204			None	None		None	None	None
S-101				ENRAF	None	None		
S-102	X			ENRAF	None	None		
S-103				ENRAF	None	None		
S-104				LOW		None	None	
S-105				LOW	None	None		
S-106				ENRAF	None	None		
S-107				ENRAF	None	None		None
S-108				LOW	None	None		
S-109				LOW	None	None		
S-110				LOW	None	None		
S-111	X			ENRAF	None	None		
S-112	X			LOW	None	None		
SX-101	X			LOW	None	None		
SX-102	X			LOW	None	None		
SX-103	X			LOW	None	None		
SX-104	X			LOW	None	None		
SX-105	X			LOW	None	None		
SX-106	X			ENRAF	None	None		
SX-107		X		None		None	None	None
SX-108		X		None		None	None	None

TABLE A-5. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS
149 TANKS (Sheet 3 of 6)

Tank Number	Tank Category		Temperature Readings (4)	Primary Leak Detection Source (5)	Surface Level Readings (1) (OSD)			LOW Readings (OSD)(5,7) Neutron
	Watch List	High Heat			MT	FIC	ENRAF	
SX-109 (3)	X	X		None	None	None		None
SX-110		X		None		None	None	None
SX-111		X		None		None	None	None
SX-112		X		None		None	None	None
SX-113				None		None	None	None
SX-114				None		None	None	None
SX-115			None	None		None	None	None
T-101				None	None	None		None
T-102			None	ENRAF	None	None		None
T-103				None	None	None		None
T-104				LOW	None	None		
T-105			None	None	None	None		None
T-106				None	None	None		None
T-107				ENRAF	None	None		None
T-108				ENRAF	None	None		None
T-109				None	None	None		None
T-110	X			LOW	None	None		
T-111	X			LOW	None	None		
T-112				ENRAF	None	None		None
T-201				MT		None	None	None
T-202				MT		None	None	None
T-203				None		None	None	None
T-204				MT		None	None	None
TX-101			None	ENRAF	None	None		None
TX-102				LOW	None	None		
TX-103				None	None	None		None
TX-104				None	None	None		None
TX-105	X			None	None	None		None (7)
TX-106				LOW	None	None		
TX-107				None	None	None		None
TX-108				None	None	None		None
TX-109				LOW	None	None		
TX-110			None	LOW	None	None		
TX-111				LOW	None	None		
TX-112				LOW	None	None		
TX-113				LOW	None	None		
TX-114			None	LOW	None	None		
TX-115				LOW	None	None		
TX-116			None	None	None	None		None
TX-117			None	LOW	None	None		
TX-118				LOW	None	None		
TY-101				None	None	None		None
TY-102				ENRAF	None	None		None
TY-103				LOW	None	None		
TY-104				ENRAF	None	None		None
TY-105				None	None	None		None
TY-106				None	None	None		None
U-101				MT		None	None	None
U-102				LOW	None	None		
U-103	X			ENRAF	None	None		
U-104			None	None		None	None	None
U-105	X			ENRAF	None	None		None
U-106	X			ENRAF	None	None		

TABLE A-5. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS
149 TANKS (Sheet 4 of 6)

Tank Number	Tank Category		Temperature Readings (4)	Primary Leak Detection Source (5)	Surface Level Readings (1) (OSD)			LOW Readings (OSD)(5,7) Neutron
	Watch List	High Heat			MT	FIC	ENRAF	
U-107	X			ENRAF	None	None		
U-108	X			LOW	None	None		
U-109	X			ENRAF	None	None		
U-110				None	None	None		None
U-111	X			LOW	None	None		
U-112				None		None	None	None
U-201				MT		None	None	None
U-202				MT		None	None	None
U-203	X			None	None	None		None
U-204	X			ENRAF	None	None		None
Catch Tanks and Special Surveillance Facilities								
A-302-A	N/A	N/A	N/A	(6)	None	None		None
A-302-B	N/A	N/A	N/A	(6)		None	None	None
ER-311	N/A	N/A	N/A	(6)	None		None	None
AX-152	N/A	N/A	N/A	(6)		None	None	None
AZ-151	N/A	N/A	N/A	(6)	None		None	None
AZ-154	N/A	N/A	N/A	(6)		None	None	None
BX-TK/SMP	N/A	N/A	N/A	(6)		None	None	None
A-244 TK/SMP	N/A	N/A	N/A	(6)	None	None	None	None
AR-204	N/A	N/A	N/A	(6)			None	None
A-417	N/A	N/A	N/A	(6)	None	None	None	None
A-350	N/A	N/A	N/A	(6)	None	None	None	None
CR-003	N/A	N/A	N/A	(6)	None	None	None	None
Vent Sta.	N/A	N/A	N/A	(6)		None	None	None
S-302	N/A	N/A	N/A	(6)	None	None		None
S-302-A	N/A	N/A	N/A	(6)	None		None	None
S-304	N/A	N/A	N/A	(6)	None	None		None
TX-302-B	N/A	N/A	N/A	(6)		None	None	None
TX-302-C	N/A	N/A	N/A	(6)	None	None		None
U-301-B	N/A	N/A	N/A	(6)	None	None		None
UX-302-A	N/A	N/A	N/A	(6)	None	None		None
S-141	N/A	N/A	N/A	(6)	O/S (12)	None	None	None
S-142	N/A	N/A	N/A	(6)	O/S (12)	None	None	None
Totals:	32	10	N/C: 0		N/C: 0	N/C: 0	N/C: 0	N/C: 0
149 tanks	Watch List Tanks (4)	High Heat Tanks (4)						

TABLE A-5. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS -149 TANKS
(Sheet 5 of 6)

Footnotes:

1. All SSTs have either manual tape, FIC, or ENRAF surface level measuring devices. Some also have zip cords.

ENRAF gauges are being installed to replace FICs (or sometimes manual tapes). The ENRAF gauges are being connected to TMACS, but many are currently being read manually from the field. See Table A-7 for list of ENRAF installations.
2. High heat tanks have active exhausters; psychrometrics can be taken in the high heat tanks. Psychrometric readings are taken on an "as needed" basis with the exception of tanks C-105 and C-106. Hanford Federal Facility Agreement and Consent Order, "Washington State Department of Ecology, U. S. Environmental Protection Agency, and U. S. Department of Energy," Fourth Amendment 1994 (Tri-Party Agreement) requires psychrometric readings to be taken in C-105 and C-106 on a monthly frequency. Tank C-105 exhauster has been shut down for preparation of C-106 sluicing. There were no psychrometrics performed on C-105 and C-106 during November. Also, SX-farm now has psychrometrics taken monthly.
3. C-106 and SX-109 - these tanks are on both category lists (Watch List and high heat list) - C-106 is the only tank on the high heat list included on the High Heat Watch List; SX-109 is on the Organics Watch List, and also on the high heat list (but not on the High Heat Watch List).
4. Temperature readings may be regulated by OSD or POP. Temperatures cannot be obtained in 13 low heat load tanks (see Table A-4). The OSD does not require readings or repair of out-of service thermocouples for the low heat load ($\leq 40,000$ Btu/h) tanks. However, the POP requires that attempts are to be made semiannually in January and July to obtain readings for these tanks.

Temperatures for many tanks are monitored continuously by TMACS; see Table A-8, TMACS Monitoring Status.

5. Document WHC-OSD-T-151-00031, "Operating Specifications for Tank Farm Leak Detection," requires that single-shell tanks with the surface level measurement device contacting liquid, partial liquid, or floating crust surface, will be monitored for leak detection on a daily basis. Tanks with a solid surface will be monitored for leak detection on a weekly basis by taking neutron scan data from a Liquid Observation Well (LOW), if an LOW is present. Tanks with a solid surface but without LOWs will not be monitored for leak detection if the tank has been interim stabilized, until an LOW is installed. Non-interim-stabilized tanks will have drywell surveys taken as a backup on a monthly basis if surface or interstitial level measurement equipment is unavailable. The OSD specifies what leak detection methods are to be used for each tank, and the requirements if the readings are not taken on the required frequency or if equipment is out of service.
6. Leak detection for the catch tanks is performed by monitoring for the buildup of liquid in the secondary containment (for most tanks with secondary containment) or for decrease in the liquid level for those tanks without secondary containment or secondary containment monitoring.

Catch tanks 240-S-302 and 241-S-302-A are monitored for intrusions only, and are not subject to leak detection monitoring requirements until liquid is present above the intrusion level.

Weight Time Factor is the surface level measuring device currently used in A-417, A-350 and 244-A-Tank/Sump. DCRT CR-003 is inactive and measured in gallons.

7. Document WHC-SD-WM-TI-605, REV. 0, dated January 1994, describes the rationale for Liquid Observation Well (LOW) installation priority. This priority is based on tank leak status, tank surface condition, and tank stabilization status. Also included is a listing of tanks with the waste level being below two feet which have no

TABLE A-5. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS - 149 TANKS
(Sheet 6 of 6)

priority assigned because no effort will be made to install LOWs in the near future. LOW probes are unable to accurately monitor interstitial liquid levels less than two feet high.

Tanks which will not receive LOWs:

A-102	BX-101	C-201	T-106
A-104	BX-103	C-202	T-108
A-105	BX-105	C-203	T-109
AX-102	BX-106	C-204	TX-107
AX-104	BX-108	SX-110	TY-102
B-102	C-108	SX-113	TY-104
B-103	C-109	SX-115	TY-106
B-112	C-111	T-102	U-101
		T-103	U-112

Total - 34 Tanks

8. TX-105 - the riser has been removed; the LOW has not been monitored since January 1987. Liquid levels are being taken.
9. All drywell scans are done by request only, when required in addition to, or as a BACKUP for, a PRIMARY leak detection method, per OSD-T-151-00031. Currently, there are only two tanks which require drywell scans (C-105 and C-106); these are taken monthly.

Only two tank farms, A and SX, have laterals. There are currently no functioning laterals and no plans to prepare these for use.
10. AX-101 - LOW readings are taken by gamma sensors.
11. SX-101 - ENRAF data suspect: core sampling done - displacer sticks on top of crust or goes into hole. LOW is primary device. ENRAF was flushed and recalibrated September 1, 1998, and the reading was back to near normal. Data marked suspect since September 10, when readings began fluctuating daily from 163 inches to 169 inches (new baseline established November 19, 1998, at 16.6 inches). Still suspect as of November 30, with 168.71 inch reading.
12. Catch Tanks S-141 and S-142 have no M.T. readings.
13. SX-104 Dome Deflection – tank dome deflection for this tank has not been performed during pumping as required by OSD-T-151-00013. The OSD required a dome deflection survey by performed every 20,000 ± 5,000 gallons net jet pump production. Approximately 28,000 gallons had been jet pumped out of SX-104 when this was discovered. See UOR PMHC-TANKFARM-1998-0131 on page 5 of the Monthly Summary Tank Investigations. **Dome deflection surveys are now being done according to this requirement.**

TABLE A-6. DOUBLE-SHELL TANKS MONITORING COMPLIANCE STATUS

28 TANKS (Sheet 1 of 2)

November 30, 1998

The following table indicates whether Double-Shell tank monitoring was in compliance with the requirements as specified in the applicable documents as of the last day of the applicable month.

NOTE:

Dome Elevation Surveys are not required for DSTs.

Psychrometrics and in-tank photos/videos are taken "as needed" (2)

LEGEND:

(Shaded) = In compliance with all applicable documentation

N/C = Noncompliance with applicable documentation

FIC/ENRAF = Surface level measurement devices

M.T.

OSD = OSD-T-151-0007, OSD-T-151-0031

None = no M.T., FIC or ENRAF installed

O/S = Out of Service

W.F. = Weight Factor

Rad. = Radiation

Tank Number	Watch List	Temperature Readings (3) (OSD)	Surface Level Readings (1) (OSD)			Radiation Readings		Annulus (OSD)
						Leak Detection Pits (4) (OSD)		
			M.T.	FIC	ENRAF	W.F.	Rad. (8)	
AN-101				None			(8)	
AN-102					None		(8)	
AN-103	X			None		O/S	(8)	
AN-104	X		O/S	None			(8)	
AN-105	X		O/S	None			(8)	
AN-106					None		(8)	
AN-107					None		(8)	
AP-101			O/S		None	O/S (8)	(8)	
AP-102					None	O/S (8)	(8)	
AP-103					None	O/S (8)	(8)	
AP-104			O/S		None	O/S (8)	(8)	
AP-105					None	O/S (8)	(8)	
AP-106					None	O/S (8)	(8)	
AP-107					None	O/S (8)	(8)	
AP-108					None	O/S (8)	(8)	
AW-101	X		O/S	None			(8)	
AW-102					(8)		(8)	
AW-103				None			(8)	
AW-104				None			(8)	
AW-105				None			(8)	
AW-106				None			(8)	
AY-101				None		O/S	(8)	(5)
AY-102				None			(8)	
AZ-101			O/S	None			(8)	(5)
AZ-102					None		(8)	(5)
SY-101	X		O/S	None			(8)	
SY-102				None			(8)	
SY-103	X			None		(7)	(8)	
Totals: 28 tanks	6 Watch List Tanks	N/C: 0	N/C: 0	N/C: 0	N/C: 0	N/C: 0	N/C: 0	N/C: 0

TABLE A-6. DOUBLE-SHELL TANKS MONITORING COMPLIANCE STATUS - 28 TANKS
 (Sheet 2 of 2)

Footnotes:

1. Some double-shell tanks have both FIC and manual tape which is used when the FIC is out of service. Noncompliance (N/C) will be shown when no readings are obtained. ENRAF gauges are being installed to replace FICs. The ENRAF gauges are being connected to TMACS, but some are currently being read manually.
2. Psychrometric readings are taken on an "as needed" basis. No psychrometric readings are currently being taken in the double-shell tanks.
3. OSD specifies double-shell tank temperature limits, gradients, etc.
4. Applicable OSD and HNF-IP-0842, latest revisions, are used as guidelines for monitoring Leak Detection Pits. See also (8) below.
5. AY-101 and AZ-101/102 are monitored only by the annulus Leak Detection Probe Measurement device.
6. AW-102 has ENRAF, FIC and M.T. At some point the FIC will be removed.
7. SY-103 - CWF reading is above normal range of 24 inches.
8. USQ TF-97-0038, dated April 28, 1997, specifies discontinuing the use of leak detection pit radiation monitoring equipment in all double-shell tank farms where the leak detection pits are used as tertiary leak detection. This applies to all double-shell tank farms

Also, two radiation monitors used for leak detection for transfer lines will not be discontinued (CRM-101B in AY farm and CRM-101/102-1 in AZ farm) - these were not included in the USQ. May 1998 - RAD monitoring is no longer required in these monitors per TSR-006 (Rev 0-6)

9. Weekly readings being obtained by Instrument Technicians in these tanks:
 AP-103C (for tanks AP-101 - 104)
 AP-105C (for tanks AP-105 - 108)

**TABLE A-7. ENRAF SURFACE LEVEL GAUGE INSTALLATION AND
DATA INPUT METHODS**
November 30, 1998

LEGEND CASS = Computer Automated Surveillance System SACS = Surveillance Analysis Computer System TMACS = Tank Monitor and Control System Auto = Automatically entered into TMACS and electronically transmitted to SACS Manual = EITHER manually entered into CASS by field operators and electronically transmitted to SACS OR manually entered directly into SACS by surveillance personnel, from Field Data sheets											
EAST AREA						WEST AREA					
Tank No.	Installed Date	Input Method	Tank No.	Installed Date	Input Method	Tank No.	Installed Date	Input Method	Tank No.	Installed Date	Input Method
A-10	09/95	Auto	B-201			S-101	02/95	Manual	TX-101	11/95	Auto
A-102			B-202			S-102	06/95	Auto	TX-102	05/96	Auto
A-103	07/96	Auto	B-203			S-103	06/94	Auto	TX-103	12/95	Auto
A-104	05/96	Manual	B-204			S-104			TX-104	03/96	Auto
A-105			BX-101	04/96	Auto	S-105	07/95	Manual	TX-105	04/96	Auto
A-106	01/96	Auto	BX-102	06/96	Auto	S-106	06/94	Auto	TX-106	04/96	Auto
AN-101	08/96	Auto	BX-103	04/96	Auto	S-107	06/94	Auto	TX-107	04/96	Auto
AN-102			BX-104	05/96	Auto	S-108	07/95	Manual	TX-108	04/96	Auto
AN-103	08/95	Auto	BX-105	03/96	Auto	S-109	08/95	Manual	TX-109	11/95	Auto
AN-104	08/95	Auto	BX-106	07/94	Auto	S-110	08/95	Manual	TX-110	06/96	Auto
AN-105	08/95	Auto	BX-107	06/96	Auto	S-111	08/94	Auto	TX-111	05/96	Auto
AN-106			BX-108	05/96	Auto	S-112	05/95	Auto	TX-112	05/96	Auto
AN-107			BX-109	08/95	Auto	SX-101	04/95	Auto	TX-113	05/96	Auto
AP-101			BX-110	06/96	Auto	SX-102	04/95	Auto	TX-114	05/96	Auto
AP-102			BX-111	06/96	Auto	SX-103	04/95	Auto	TX-115	05/96	Auto
AP-103			BX-112	03/96	Auto	SX-104	05/95	Auto	TX-116	05/96	Auto
AP-104			BY-101			SX-105	05/95	Auto	TX-117	06/96	Auto
AP-105			BY-102			SX-106	08/94	Auto	TX-118	03/96	Auto
AP-106			BY-103	12/96	Manual	SX-107			TY-101	07/95	Auto
AP-107			BY-104			SX-108			TY-102	09/95	Auto
AP-108			BY-105			SX-109	09/98	Auto	TY-103	09/95	Auto
AW-101	08/95	Auto	BY-106			SX-110			TY-104	06/95	Auto
AW-102	05/96	Auto	BY-107			SX-111			TY-105	12/95	Auto
AW-103	05/96	Auto	BY-108			SX-112			TY-106	12/95	Auto
AW-104	01/96	Auto	BY-109			SX-113			U-101		
AW-105	06/96	Auto	BY-110	2/97	Manual	SX-114			U-102	01/96	Manual
AW-106	06/96	Auto	BY-111	2/97	Manual	SX-115			U-103	07/94	Auto
AX-101	09/95	Auto	BY-112			SY-101	07/94	Auto	U-104		
AX-102	09/98	Manual	C-101			SY-102	06/94	Manual	U-105	07/94	Auto
AX-103	09/95	Auto	C-102			SY-103	07/94	Auto	U-106	08/94	Auto
AX-104	10/96	Auto	C-103	08/94	Auto	T-101	05/95	Manual	U-107	08/94	Auto
AY-101	03/96	Manual	C-104			T-102	06/94	Auto	U-108	05/95	Auto
AY-102	01/98	Auto	C-105	05/96	Manual	T-103	07/95	Manual	U-109	07/94	Auto
AZ-101	08/96	Manual	C-106	02/96	Auto	T-104	12/95	Manual	U-110	01/96	Manual
AZ-102			C-107	04/95	Auto	T-105	07/95	Manual	U-111	01/96	Manual
B-101			C-108			T-106	07/95	Manual	U-112		
B-102	02/95	Manual	C-109			T-107	06/94	Auto	U-201		
B-103			C-110			T-108	10/95	Manual	U-202		
B-104			C-111			T-109	09/94	Manual	U-203	09/98	Manual
B-105			C-112	03/96	Manual	T-110	06/95	Auto	U-204	6/98	Manual
B-106			C-201			T-111	07/95	Manual			
B-107			C-202			T-112	09/95	Manual			
B-108			C-203			T-201					
B-109			C-204			T-202					
B-110						T-203					
B-111						T-204					
B-112	03/95	Manual									
Total East Area: 43						Total West Area: 69					

112 ENRAFs installed: 80 automatically entered into TMACS, 32 manually entered into CASS

TABLE A-8. TANK MONITOR AND CONTROL SYSTEM (TMACS)

November 30, 1998

Note: Indicated below are the number of tanks having at least one operating sensor (some tanks have more than one sensor: multiple sensors of the same type in a tank are not shown in the table) for example: 10 tanks in BY-Farm have at least one operating TC sensor and 3 tanks in BY-Farm have at least one operating RTD sensor.

Acceptance Testing Completed: Sensors Automatically Monitored by TMACS

EAST AREA	Temperatures		ENRAF Level Gauge	Pressure (b)	Hydrogen (c)	Gas Sample Flow
	Thermocouple Tree (TC)	Resistance Thermal Device (RTD)				
Tank Farm						
A-Farm (6 Tanks)	1		3		1	1
AN-Farm (7 Tanks)	7		4	7	3	3
AP-Farm (8 Tanks)						
AW-Farm (6 Tanks)	6		6		1	1
AX-Farm (4 Tanks)	3		3		(d)	
AY-Farm (2 Tanks)			1			
AZ-Farm (2 Tanks)						
B-Farm (16 Tanks)	1					
BX-Farm (12 Tanks)	11		12			
BY-Farm (12 Tanks)	10	3				
C-Farm (16 Tanks)	15	1	3	1		
TOTAL EAST AREA (91 Tanks)	54	4	32	8	5	5
WEST AREA						
S-Farm (12 Tanks)	12		6	1	3	3
SX-Farm (15 Tanks)	14		7	1	7	7
SY-Farm (3 Tanks) (a)	3		2	1	2	2
T-Farm (16 Tanks)	14	1	3		1	1
TX-Farm (18 Tanks)	13		18			
TY-Farm (6 Tanks)	6	3	6			
U-Farm (16 Tanks)	15		6	4	6	6
TOTAL WEST AREA (86 Tanks)	81	4	48	7	18	18
TOTALS (177 Tanks)	131	8	80	15	23	23

(a) Tank SY-101 has 2 gas sample flow sensors plus 2 vent flow sensors, and 2 ENRAFs.

(b) Each tank has low and high range sensors (9x2=18 sensors)

(c) Each tank has low and high range sensors (17x2=34 sensors)

(d) AX-101 Hydrogen was ATP'd in TMACS on September 21, 1998, but not transmitting yet - lines plugged.

APPENDIX B

DOUBLE SHELL TANK WASTE TYPE AND SPACE ALLOCATION

**TABLE B-1. DOUBLE-SHELL TANK WASTE TYPE AND SPACE ALLOCATION
NOVEMBER 1998**

DOUBLE-SHELL TANK INVENTORY BY WASTE TYPE		SPACE DESIGNATED FOR SPECIFIC USE	
Complexed Waste (AN-102, AN-106, AN-107, SY-101, SY-103, (AY-101 , AP-108 (DC))	3.97 Mgal	Spare Tanks (3) (1 Aging & 1 Non-Aging Waste Tank)	2.28 Mgal
Concentrated Phosphate Waste (AP-102)	1.09 Mgal	Watch List Tank Space (AN-103, AN-104, AN-105, AW-101, SY-101, SY-103)	0.67 Mgal
Double-Shell Slurry and Slurry Feed (AN-103, AN-104, AN-105, AP-101, AW-101, AW-106)	4.4 Mgal	Segregated Tank Space (AN-102, AN-106, AN-107, AP-102, AP-108, AY-101 AZ-101, AZ-102)	3.23 Mgal
Aging Waste (NCAW) at 5M Na Dilute in Aging Tanks (AZ-101, AZ-102)	1.23 Mgal	Receiver/Operational Tank Space (2) (AN-101, AP-106, AW-102, AW-106, SY-102)	3.06 Mgal
Dilute Waste (1) (AN-101, AP-103, AP-105, AP-104, AP-106, AP-107, AW-102, AW-103, AW-104, AW-105, AY-102, SY-102)	3.64 Mgal	Total Specific Use Space (11/30/98)	9.23 Mgal
NCRW, PFP and DST Settled Solids (All DSTs)	4.04 Mgal	TOTAL DOUBLE-SHELL TANK SPACE	
		24 Tanks at 1140 Kgal	27.36 Mgal
		4 Tanks at 980 Kgal	3.92 Mgal
			31.28 Mgal
Total Inventory=		Total Available Space	31.28 Mgal
	18.74 Mgal	Double-Shell Tank Inventory	18.74 Mgal
		Space Designated for Specific Use	9.23 Mgal
		Remaining Unallocated Space	3.31 Mgal

- (1) Was reduced in volume by -0.00 Mgal this month (Evaporator WVR)
 (2) Tank Space Reduced by Facility Generations and Saltwell Liquid pumping
 (3) 241-AY-101: A minimum liquid level is set to provide extra protection against any bottom uplifting of the tank's steel liner.
 Because of space availability, waste is stored in AY-102, the aging waste spare tank. In case of a leak the contents of AY-102 will be distributed to any other DST(s) having available space.

Note: Net change in total DST inventory since last month: +0.069 Mgal

WVPTOT

Table B-2. Double Shell Tank Waste Inventory for November 30, 1998

TANKS	INVENTORY	SOLIDS	TYPE	LEFT
AN-101=	158	33	DN	982
AN-102=	1065	89	CC	75
AN-103=	958	410	DSS	182
AN-104=	1054	449	DSSF	86
AN-105=	1128	489	DSSF	12
AN-106=	39	17	CC	1101
AN-107=	1047	247	CC	93
AP-101=	1115	0	DSSF	25
AP-102=	1093	0	CP	47
AP-103=	24	1	DN	1116
AP-104=	24	0	DN	1116
AP-105=	767	89	DSSF	373
AP-106=	389	0	DN	751
AP-107=	23	0	DN	1117
AP-108=	254	0	DC	886
AW-101=	1125	306	DSSF	15
AW-102=	590	40	DN	550
AW-103=	512	347	NCRW	628
AW-104=	1119	231	DN	21
AW-105=	433	280	NCRW	707
AW-106=	580	228	CC	560
AY-101=	168	108	DC	812
AY-102=	467	30	DN	513
AZ-101=	849	47	NCAW	131
AZ-102=	900	104	NCAW	80
SY-101=	1165	41	CC	-25
SY-102=	953	88	DN/PT	187
SY-103=	745	362	CC	395
TOTAL=	18744	4036		12535

NOTE: Solids Adjusted to Most Current Available Data

NOTE: All Volumes In Kilo-Gallons (Kgals)

TOTAL DST SPACE AVAILABLE	
NON-AGING =	27360
AGING =	3920
TOTAL=	31280

DST INVENTORY CHANGE	
10/98 TOTAL	18675
11/98 TOTAL	18744
INCREASE	69

WATCH LIST SPACE	
AN-103=	182
AN-104=	86
AN-105=	12
AW-101=	15
SY-101=	-25
SY-103=	395
TOTAL=	665

USABLE SPACE	
AP-101=	25
AP-103=	1116
AP-104=	1116
AP-105=	373
AP-107=	1117
AW-102=	550
AW-103=	628
AW-104=	21
AW-105=	707
AW-106=	560
AY-102=	513
TOTAL=	6726
EVAP. OPERATIONS	-1140
SPARE SPACE	-2280
USABLE LEFT=	3306

SEGREGATED SPACE (DC,CC,CP,AW)	
AN-102=	75
AN-106=	1101
AN-107=	93
AP-102=	47
AP-108=	886
AY-101=	812
AZ-101=	131
AZ-102=	80
TOTAL=	3226

USABLE SPACE CHANGE	
10/98 TOTAL SPACE	3314
11/98 TOTAL SPACE	3306
CHANGE=	-8

WASTE RECEIVER SPACE	
AN-101 (200E/DC)=	982
AN-106 (200E/DN)=	751
SY-102 (200W/DN)=	187
TOTAL=	1920

WASTE RECEIVER SPACE CHANGE	
10/98 TOTAL SPACE	1961
11/98 TOTAL SPACE	1920
CHANGE=	-41

Inventory Calculation by Waste Type:

COMPLEXED WASTE	
AN-102=	976 (CC)
AN-106=	22 (CC)
AN-107=	800 (CC)
AP-108=	254 (DC)
AW-106=	352 (CC)
AY-101=	60 (DC)
SY-101=	1124 (CC)
SY-103=	383 (CC)
TOTAL DC/CC=	3971
TOTAL SOLIDS=	1092

NCRW SOLIDS (PD)	
AW-103=	347
AW-105=	280
TOTAL=	627

PFP SOLIDS (PT)	
SY-102=	88
TOTAL=	88

CONCENTRATED PHOSPHATE (CP)	
102-AP=	1093
TOTAL=	1093

DILUTE WASTE (DN)	
AN-101=	125
AP-103=	23
AP-104=	24
AP-106=	389
AP-107=	23
AW-102=	550
AW-103=	185
AW-104=	888
AW-105=	153
AY-102=	437
SY-102=	865
TOTAL DN=	3642
TOTAL SOLIDS=	335

NCAW (AGING WASTE) (@ 5M Na)	
AZ-101=	791
AZ-102=	434
TOTAL @ -5M Na=	1225
TOTAL DN=	373
TOTAL SOLIDS=	181

DSS/DSSF	
AN-103=	548
AN-104=	605
AN-105=	639
AP-101=	1115
AP-105=	678
AW-101=	819
TOTAL DSS/DSSF=	4404
TOTAL SOLIDS=	1743

GRAND TOTALS	
NCRW SOLIDS=	627
DST SOLIDS=	3170
PFP SOLIDS=	88
AGING SOLIDS=	151
CC=	3857
DC=	314
CP=	1093
NCAW=	1598
DSS/DSSF=	4404
DILUTE=	3642
TOTAL=	18744

NOTE: Tank AW-106 (evaporator receiver) has Concentrated Complexed (CC) waste in it and will be transferred to Tank 106-AN.

Inv1198

Table B-2. Double Shell Tank Waste Inventory for November 30, 1998

TOTAL AVAILABLE SPACE AS OF NOVEMBER 30, 1998:			12682 KGALS
WATCH LIST TANK SPACE:	TANK	WASTE TYPE	AVAILABLE SPACE
<i>Unusable DST Headspace - Due to Special Restrictions</i>	AN-103	DSS	182 KGALS
<i>Placed on the Tanks, as Stated in the "Wyden Bill"</i>	AN-104	DSSF	86 KGALS
	AN-105	DSSF	12 KGALS
	AW-101	DSSF	15 KGALS
	SY-101	CC	-25 KGALS
	SY-103	CC	395 KGALS
		TOTAL=	-665 KGALS
AVAILABLE TANK SPACE=			12682 KGALS
MINUS WATCH LIST SPACE=			-665 KGALS
TOTAL AVAILABLE SPACE AFTER WATCH LIST SPACE DEDUCTIONS=			12017 KGALS
SEGREGATED TANK SPACE:	TANK	WASTE TYPE	AVAILABLE SPACE
<i>DST Headspace Available to Store Only Specific Waste Type</i>	AN-102	CC	75 KGALS
	AN-106	CC	1101 KGALS
	AN-107	CC	93 KGALS
	AP-102	CP	47 KGALS
	AP-108	DC	886 KGALS
	AY-101	DC	812 KGALS
	AZ-101	AW	131 KGALS
	AZ-102	AW	80 KGALS
		TOTAL=	3225 KGALS
AVAILABLE SPACE AFTER WATCH LIST DEDUCTIONS=			12017 KGALS
MINUS SEGREGATED SPACE=			-3225 KGALS
TOTAL AVAILABLE SPACE AFTER SEGREGATED SPACE DEDUCTIONS=			8792 KGALS
USABLE/WASTE RECEIVER TANK SPACE:	TANK	WASTE TYPE	AVAILABLE SPACE
<i>DST Headspace Available to Store Facility Generated and Evaporator Product Waste</i>	AN-101	DN	982 KGALS
	AP-101	DSSF	25 KGALS
	AP-103	DN	1116 KGALS
	AP-104	DN	1116 KGALS
	AP-105	DSSF	373 KGALS
FACILITY WASTE RECEIVER TANK	AP-106	DN	751 KGALS
	AP-107	DN	1117 KGALS
EVAPORATOR FEED TANK	AW-102	DN	550 KGALS
	AW-103	NCRW	628 KGALS
	AW-104	DN	21 KGALS
	AW-105	NCRW	707 KGALS
EVAPORATOR RECEIVER TANK	AW-106	CC	560 KGALS
	AY-102	DN	513 KGALS
FACILITY WASTE RECEIVER TANK	SY-102	DN	187 KGALS
		TOTAL AVAILABLE USABLE TANK SPACE=	8646 KGALS
EVAPORATOR OPERATIONAL TANK SPACE:			-1140 KGALS
SPARE TANK SPACE: (DOE Order 5820.2A)			-2280 KGALS
TOTAL TANK SPACE AVAILABLE AFTER ALL DEDUCTIONS=			5226 KGALS

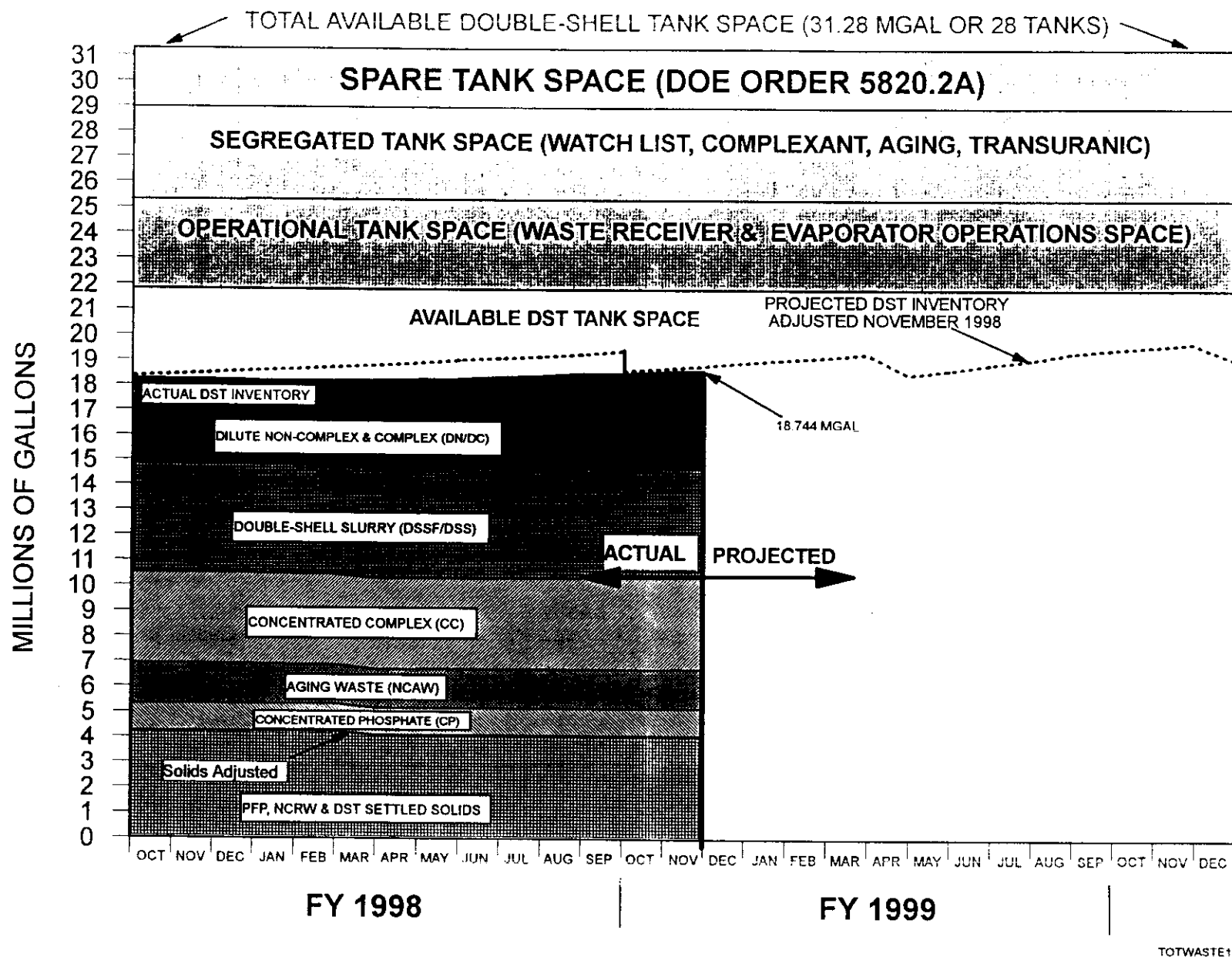


FIGURE B-1. TOTAL DOUBLE-SHELL TANK INVENTORY

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APPENDIX C

TANK AND EQUIPMENT CODE AND STATUS DEFINITIONS

C. TANK AND EQUIPMENT CODE/STATUS DEFINITIONS

November 30, 1998

1. TANK STATUS CODES

WASTE TYPE (also see definitions, section 3)

AGING	Aging Waste (Neutralized Current Acid Waste [NCAW])
CC	Complexant Concentrate Waste
CP	Concentrated Phosphate Waste
DC	Dilute Complexed Waste
DN	Dilute Non-Complexed Waste
DSS	Double-Shell Slurry
DSSF	Double-Shell Slurry Feed
NCPLX	Non-Complexed Waste
PD/PN	Plutonium-Uranium Extraction (PUREX) Neutralized Cladding Removal Waste (NCRW), transuranic waste (TRU)
PT	Plutonium Finishing Plant (PFP) TRU Solids

TANK USE (DOUBLE-SHELL TANKS ONLY)

CWHT	Concentrated Waste Holding Tank
DRCVR	Dilute Receiver Tank
EVFD	Evaporate Feed Tank
SRCVR	Slurry Receiver Tank

2. SOLID AND LIQUID VOLUME DETERMINATION METHODS

F	Food Instrument Company (FIC) Automatic Surface Level Gauge
E	ENRAF Surface Level Gauge (being installed to replace FICs)
M	Manual Tape Surface Level Gauge
P	Photo Evaluation
S	Sludge Level Measurement Device

3. DEFINITIONS

WASTE TANKS - GENERAL

Waste Tank Safety Issue

A potentially unsafe condition in the handling of waste material in underground storage tanks that requires corrective action to reduce or eliminate the unsafe condition.

Watch List Tank

An underground storage tank containing waste that requires special safety precautions because it may have a serious potential for release of high level radioactive waste because of uncontrolled increases in temperature or pressure. Special restrictions have been placed on these tanks by "Safety Measures for Waste Tanks at Hanford Nuclear Reservation," Section 3137 of the *National Defense Authorization Act for Fiscal Year 1991*, November 5, 1990, Public Law 101-510, (also known as the Wyden Amendment).

Characterization

Characterization is understanding the Hanford tank waste chemical, physical, and radiological properties to the extent necessary to insure safe storage and interim operation, and ultimate disposition of the waste.

WASTE TYPES

Aging Waste (AGING)

High level, first cycle solvent extraction waste from the PUREX plant (NCAW)

Concentrated Complexant (CC)

Concentrated product from the evaporation of dilute complexed waste.

Concentrated Phosphate Waste (CP)

Waste originating from the decontamination of the N Reactor in the 100 N Area. Concentration of this waste produces concentrated phosphate waste.

Dilute Complexed Waste (DC)

Characterized by a high content of organic carbon including organic complexants: ethylenediaminetetra-acetic acid (EDTA), citric acid, and hydroxyethyl-ethylenediaminetriacetic acid (HEDTA), being the major complexants used. Main sources of DC waste in the DST system are saltwell liquid inventory (from SSTs).

Dilute Non-Complexed Waste (DN)

Low activity liquid waste originating from T and S Plants, the 300 and 400 Areas, PUREX facility (decladding supernatant and miscellaneous wastes), 100 N Area (sulfate waste), B Plant, saltwells, and PFP (supernate).

Double-Shell Slurry (DSS)

Waste that exceeds the sodium aluminate saturation boundary in the evaporator without exceeding receiver tank composition limits. For reporting purposes, DSS is considered a solid.

Double-Shell Slurry Feed (DSSF)

Waste concentrated just before reaching the sodium aluminate saturation boundary in the evaporator without exceeding receiver tank composition limits. This form is not as concentrated as DSS.

Non-complexed (NCPLX)

General waste term applied to all Hanford Site (NCPLX) liquors not identified as complexed.

PUREX Decladding (PD)

PUREX Neutralized Cladding Removal Waste (NCRW) is the solids portion of the PUREX plant neutralized cladding removal waste stream; received in Tank Farms as a slurry. NCRW solids are classified as transuranic (TRU) waste.

PFP TRU Solids (PT)

TRU solids fraction from PFP Plant operations.

Drainable Interstitial Liquid (DIL)

Interstitial liquid that is not held in place by capillary forces, and will therefore migrate or move by gravity. (See also Section 4)

Supernate

The liquid above the solids in waste storage tanks. (See also Section 4)

Ferrocyanide

A compound of iron and cyanide commonly expressed as FeCN . The actual formula for the ferrocyanide anion is $[\text{Fe}(\text{CN})_6]^{-4}$.

INTERIM STABILIZATION (Single-Shell Tanks only)Interim Stabilized (IS)

A tank which contains less than 50 Kgallons of drainable interstitial liquid and less than 5 Kgallons of supernatant liquid. If the tank was jet pumped to achieve interim stabilization, then the jet pump flow must also have been at or below 0.05 gpm before interim stabilization criteria is met.

Jet Pump

The jet pump system includes 1) a jet assembly with foot valve mounted to the base of two pipes that extend from the top of the well to near the bottom of the well casing inside the saltwell screen, 2) a centrifugal pump to supply power fluid to the down-hole jet assembly, 3) flexible or rigid transfer jumpers, 4) a flush line, and 5) a flowmeter. The jumpers contain piping, valves, and pressure and limit switches.

The centrifugal pump and jet assembly are needed to pump the interstitial liquid from the saltwell screen into the pump pit, nominally a 40-foot elevation rise. The power fluid passes through a nozzle in the jet assembly and acts to convert fluid pressure head to velocity head, thereby reducing the pressure in the jet assembly chamber. The reduction in pressure allows the interstitial liquid to enter the jet assembly chamber and mix with the power fluid. Velocity head is converted to pressure head above the nozzle, lifting power fluid, and interstitial liquid to the pump pit. Pumping rates vary from 0.05 gallons to about 4 gpm.

Saltwell Screen

The saltwell system is a 10-inch diameter saltwell casing consisting of a stainless steel saltwell screen welded to a Schedule 40 carbon steel pipe. The casing and screen are to be inserted into the 12-inch tank riser located in the pump pit. The stainless steel screen portion of the system will extend through the tank waste to near the bottom of the tank. The saltwell screen portion of the casing is an approximately 10-foot length of 300 Series, 10-inch diameter, stainless steel pipe with screen openings (slots) of 0.05 inches.

Emergency Pumping Trailer

A 45-foot tractor-type trailer is equipped to provide storage space and service facilities for emergency pumping equipment: this consists of two dedicated jet pump jumpers and two jet pumps, piping and dip tubes for each, two submersible pumps and attached piping, and a skid-mounted Weight Factor Instrument Enclosure (WFIE) with an air compressor and electronic recording instruments. The skid also contains a power control station for the pumps, pump pit leak detection, and instrumentation. A rack for over 100 feet of overground double-contained piping is also in the trailer.

INTRUSION PREVENTION (ISOLATION) Single-Shell Tanks onlyPartially Interim Isolated (PI)

The administrative designation reflecting the completion of the physical effort required for Interim Isolation except for isolation of risers and piping that is required for jet pumping or for other methods of stabilization.

Interim Isolated (II)

The administrative designation reflecting the completion of the physical effort required to minimize the addition of liquids into an inactive storage tank, process vault, sump, catch tank, or diversion box. In June 1993, Interim Isolation was replaced by Intrusion Prevention.

Intrusion Prevention (IP)

Intrusion Prevention is the administrative designation reflecting the completion of the physical effort required to minimize the addition of liquids into an inactive storage tank, process vault, sump, catch tank, or diversion box.

Under no circumstances are electrical or instrumentation devices disconnected or disabled during the intrusion prevention process (with the exception of the electrical pump).

Controlled, Clean, and Stable (CCS)

Controlled, Clean, and Stable reflects the completion of several objectives: "Controlled" - provide remote monitoring for required instrumentation and implement controls required in the TWRS Authorization Basis; "Clean" - remove surface soil contamination and downpost the Tank Farms to RBA/URMA/RA radiological control status, remove abandoned equipment, and place reusable equipment in compliant storage; and "Stable" - remove pumpable liquids from the SSTs and IMUSTs and isolate the tanks.

TANK INTEGRITY

Sound

The integrity classification of a waste storage tank for which surveillance data indicate no loss of liquid attributed to a breach of integrity.

Assumed Leaker

The integrity classification of a waste storage tank for which surveillance data indicate a loss of liquid attributed to a breach of integrity.

Assumed Re-Leaker

A condition that exists after a tank has been declared as an "assumed leaker" and then the surveillance data indicates a new loss of liquid attributed to a breach of integrity.

TANK INVESTIGATION

Intrusion

A term used to describe the infiltration of liquid into a waste tank.

SURVEILLANCE INSTRUMENTATION

Drywells

Drywells are vertical boreholes with 6-inch (internal diameter) carbon steel casings positioned radially around SSTs. These wells range between 50 and 250 feet in depth, and are monitored between the range of 50 to 150 feet. The wells are sealed when not in use. They are called drywells because they do not penetrate to the water table and are therefore usually "dry." There are 759 drywells.

Monitoring is done by gamma radiation or neutron-moisture sensors to obtain scan profiles of radiation or moisture in the soil as a function of well depth, which could be indicative of tank leakage.

Two single-shell tanks (C-105 and C-106) are currently monitored monthly by gamma radiation sensors. The remaining drywells are monitored on request by gamma radiation sensors. Monitoring by neutron-moisture sensors is done only on request.

Laterals

Laterals are horizontal drywells positioned under single-shell waste storage tanks to detect radionuclides in the soil which could be indicative of tank leakage. These drywells can be monitored by radiation detection probes. Laterals are 4-inch inside diameter steel pipes located 8 to 10 feet below the tank's concrete base. There are three laterals per tank. Laterals are located only in A and SX farms. There are currently no functioning laterals and no plan to prepare them for use.

Surface Levels

The surface level measurements in all waste storage tanks are monitored by manual or automatic conductivity probes, and recorded and transmitted or entered into the Computer Automated Surveillance System (CASS).

Automatic FIC

An automatic waste surface level measurement device is manufactured by the Food Instrument Company (FIC). The instrument consists of a conductivity electrode (plummet) connected to a calibrated steel tape, a steel tape

reel housing and a controller that automatically raises and lowers the plummet to obtain a waste surface level reading. The controller can provide a digital display of the data and also transmit the reading to the CASS. Some tanks have gauges connected to CASS and others are read manually. FICs are being replaced by ENRAF detectors (see below).

ENRAF 854 ATG Level Detector

FICs and some manual tapes are in the process of being replaced by the ENRAF ATG 854 level detector. The ENRAF gauge, fabricated by ENRAF Incorporated, determines waste level by detecting variations in the weight of a displacer suspended in the tank waste. The displacer is connected to a wire wound onto a precision measuring drum. A level causes a change in the weight of the displacer which will be detected by the force transducer. Electronics within the gauge causes the servo motor to adjust the position of the displacer and compute the tank level based on the new position of the displacer drum. The gauge displays the level in decimal inches. The first few ENRAFs that received remote reading capability transmit liquid level data via analog output to the Tank Monitor and Control System (TMACS). The remaining ENRAFs and future installations will transmit digital level data to TMACS via an ENRAF Computer Interface Unit (CIU). The CIU allows fully remote communication with the gauge, minimizing tank farm entry.

Annulus

The annulus is the space between the inner and outer shells on DSTs only. Drain channels in the insulating and/or supporting concrete carry any leakage to the annulus space where conductivity probes are installed. Alarms from the annunciators are received by CASS. Continuous Air Monitoring (CAM) alarms are also located in the annulus. The annulus conductivity probes and radiation detectors are the primary means of leak detection for all DSTs.

Liquid Observation Well (LOW)

In-tank liquid observation wells are used for monitoring the interstitial liquid level (ILL) in single-shell waste storage tanks. The wells are usually constructed of fiberglass or TEFZEL-reinforced epoxy-polyester resin (TEFZEL, a trademark of E. I. du Pont de Nemours & Company). There are a few LOWs constructed of steel. LOWs are sized to extend to within 1 inch of the bottom of the waste tank, are sealed at their bottom ends and have a nominal outside diameter of 3.5 inches. Two probes are used to monitor changes in the ILL; gamma and neutron, which can indicate intrusions or leakage by increases or decreases in the ILL. There are 65 LOWs (64 are in operation) installed in SSTs that contain or are capable of containing greater than 50 Kgallons of drainable interstitial liquid, and in two DSTs only. The LOWs installed in two DSTs, (SY-102 and AW-103 tanks), are used for special, rather than routine, surveillance purposes only.

Thermocouple (TC)

A thermocouple is a thermoelectric device used to measure temperature. More than one thermocouple on a device (probe) is called a thermocouple tree. In DSTs there may be one or more thermocouple trees in risers in the primary tank. In addition, in DSTs only, there are thermocouple elements installed in the insulating concrete, the lower primary tank knuckle, the secondary tank concrete foundation, and in the outer structural concrete.

These monitor temperature gradients within the concrete walls, bottom of the tank, and the domes. In SSTs, one or more thermocouples may be installed directly in a tank, although some SSTs do not have any trees installed. A single thermocouple (probe) may be installed in a riser, or lowered down an existing riser or LOW. There are also four thermocouple laterals beneath Tank 105-A in which temperature readings are taken in 34 thermocouples.

In-tank Photographs and Videos

In-tank photographs and videos may be taken to aid in resolving in-tank measurement anomalies and determine tank integrity. Photographs and videos help determine sludge and liquid levels by visual examination.

TERMS/ACRONYMS

CASS Computer Automated Surveillance System

<u>CCS</u>	Controlled, Clean and Stable (tank farms)
<u>II</u>	Interim Isolated
<u>IP</u>	Intrusion Prevention Completed
<u>IS</u>	Interim Stabilized
<u>MT/FIC/ENRAF</u>	Manual Tape, Food Instrument Corporation, ENRAF Corporation (surface level measurement devices)
<u>OSD</u>	Operating Specifications Document
<u>PI</u>	Partial Interim Isolated
<u>SAR</u>	Safety Analysis Reports
<u>SHMS</u>	Standard Hydrogen Monitoring System
<u>TMACS</u>	Tank Monitor and Control System
<u>TPA</u>	Hanford Federal Facility Consent and Compliance Order, "Washington State Department of Ecology, U. S. Environmental Protection Agency, and U. S. Department of Energy," Fourth Amendment, 1994 (Tri-Party Agreement)
<u>USQ</u>	Unreviewed Safety Question
<u>Wyden Amendment</u>	"Safety Measures for Waste Tanks at Hanford Nuclear Reservation," Section 3137 of the National Defense Authorization Act for Fiscal Year 1991, November 5, 1990, Public Law 101- 510.

4. INVENTORY AND STATUS BY TANK - VOLUME CALCULATIONS AND DEFINITIONS FOR TABLE E-6 (SINGLE-SHELL TANKS)

COLUMN HEADING	VOLUME CALCULATIONS/DEFINITIONS
Total Waste	Solids volume plus Supernatant liquid. Solids include sludge and saltcake (see definitions below)
Supernate Liquid	Drainable Liquid Remaining minus Drainable Interstitial. Supernate is the clear liquid floating on the surface of the waste. Supernate is usually derived by subtracting the solids level measurement from the liquid level measurement. In some cases, the supernatant volume includes floating solid crusts because their volume cannot be measured. In-tank photographs or videos are useful in estimating the liquid volumes; the area of solids covered and the average depth can be estimated.
Drainable Interstitial Liquid	Drainable Liquid Remaining minus Supernate. Drainable interstitial liquid is calculated based on the saltcake and sludge volumes, using average porosity values or actual data for each tank, when available. Interstitial liquid is liquid that fills the interstitial spaces of the solids waste. Drainable interstitial liquid is calculated based on the saltcake and sludge volumes in the tank. The sum of the interstitial liquid contained in saltcake and sludge is the initial volume of drainable interstitial liquid. The volume reported as Drainable Interstitial

COLUMN HEADING	VOLUME CALCULATIONS/DEFINITIONS
	Liquid is the initial volume of drainable interstitial liquid minus interstitial liquid removed by pumping.
Pumped This Month	Net total gallons of liquid pumped from the tank during the month. If supernate is present, pump production is first subtracted from the supernatant volume. The remainder is then subtracted from the drainable interstitial liquid volume. The total pumped volume is subtracted from drainable liquid remaining and pumpable liquid remaining. Pump production takes into account the amount of water added to the tank during the month (if any).
Total Pumped	Cumulative net total gallons of liquid pump from 1979 to date.
Drainable Liquid Remaining	Supernate plus Drainable Interstitial. (See Supernatant Liquid and Drainable Interstitial Liquid above for definitions). The total Drainable Liquid Remaining is the sum of drainable interstitial liquid and supernate minus total gallons pumped.
Pumpable Liquid Remaining	Drainable Liquid Remaining minus undrainable heel volume. (Dish bottom tanks have a "heel" where liquids can collect; flat bottom tanks do not). (See Drainable Liquid Remaining and Pumped this Month for definitions). Not all drainable interstitial liquid is pumpable. It is assumed that drainable interstitial liquid on top of the undrainable heel in sludge or saltcake, is not jet pumpable. Therefore, pumpable interstitial liquid is the initial volume of drainable interstitial liquid minus the amount of interstitial liquid on top of the heel. The volume shown as Pumpable Liquid Remaining is the sum of pumpable interstitial liquid and supernate minus total gallons pumped.
Sludge	Solids formed during sodium hydroxide additions to waste. Sludge usually was in the form of suspended solids when the waste was originally received in the tank from the waste generator. In-tank photographs or videos may be used to estimate the volume.
Saltcake	Results from crystallization and precipitation after concentration of liquid waste, usually in an evaporator. If saltcake is layered over sludge, it is only possible to measure total solids volume. In-tank photographs or videos may be used to estimate the saltcake volume.
Solids Volume Update	Indicates the latest update of any change in the solids volume.
Solids Update Source - See Footnote	Indicates the source or basis of the latest solids volume update.
Last In-tank Photo	Date of last in-tank photographs taken.
Last In-tank Video	Date of last in-tank video taken.
See Footnotes for These Changes	Indicates any change made the previous month. A footnote explanation for the change follows the Inventory and Status by Tank section (Table E-6).

APPENDIX D

TANK FARM CONFIGURATION, STATUS, AND FACILITY CHARTS

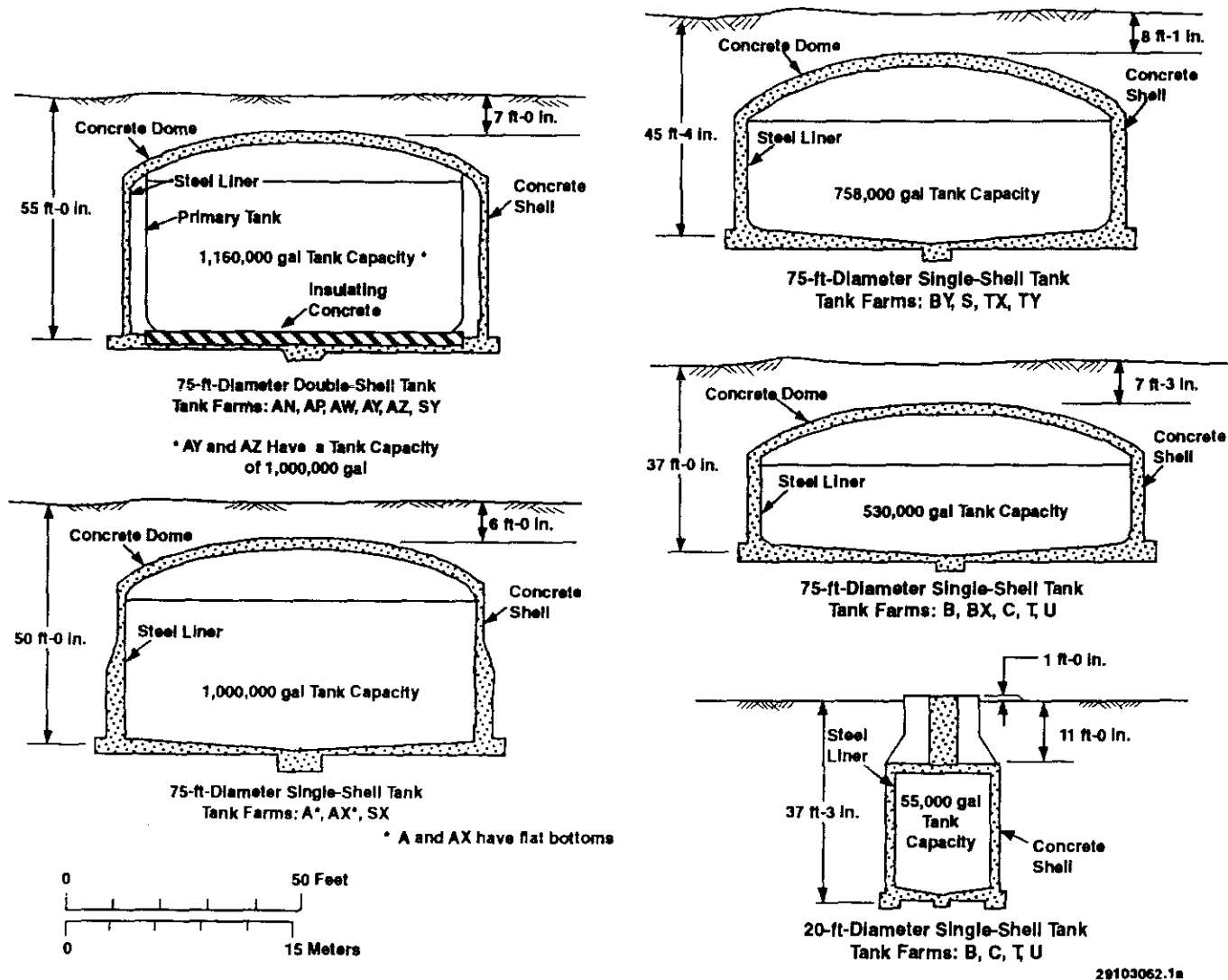


FIGURE D-1. HIGH-LEVEL WASTE TANK CONFIGURATION

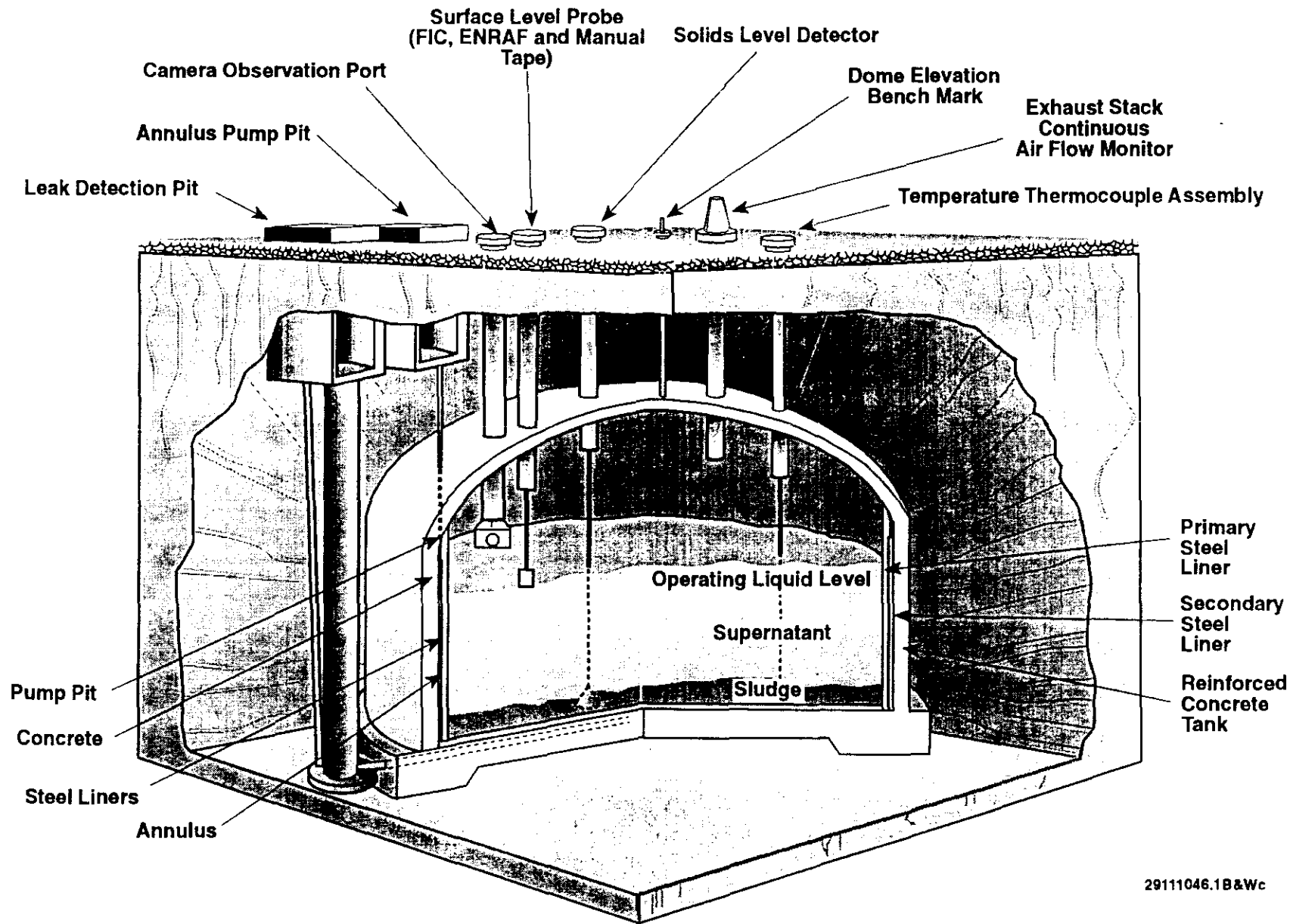
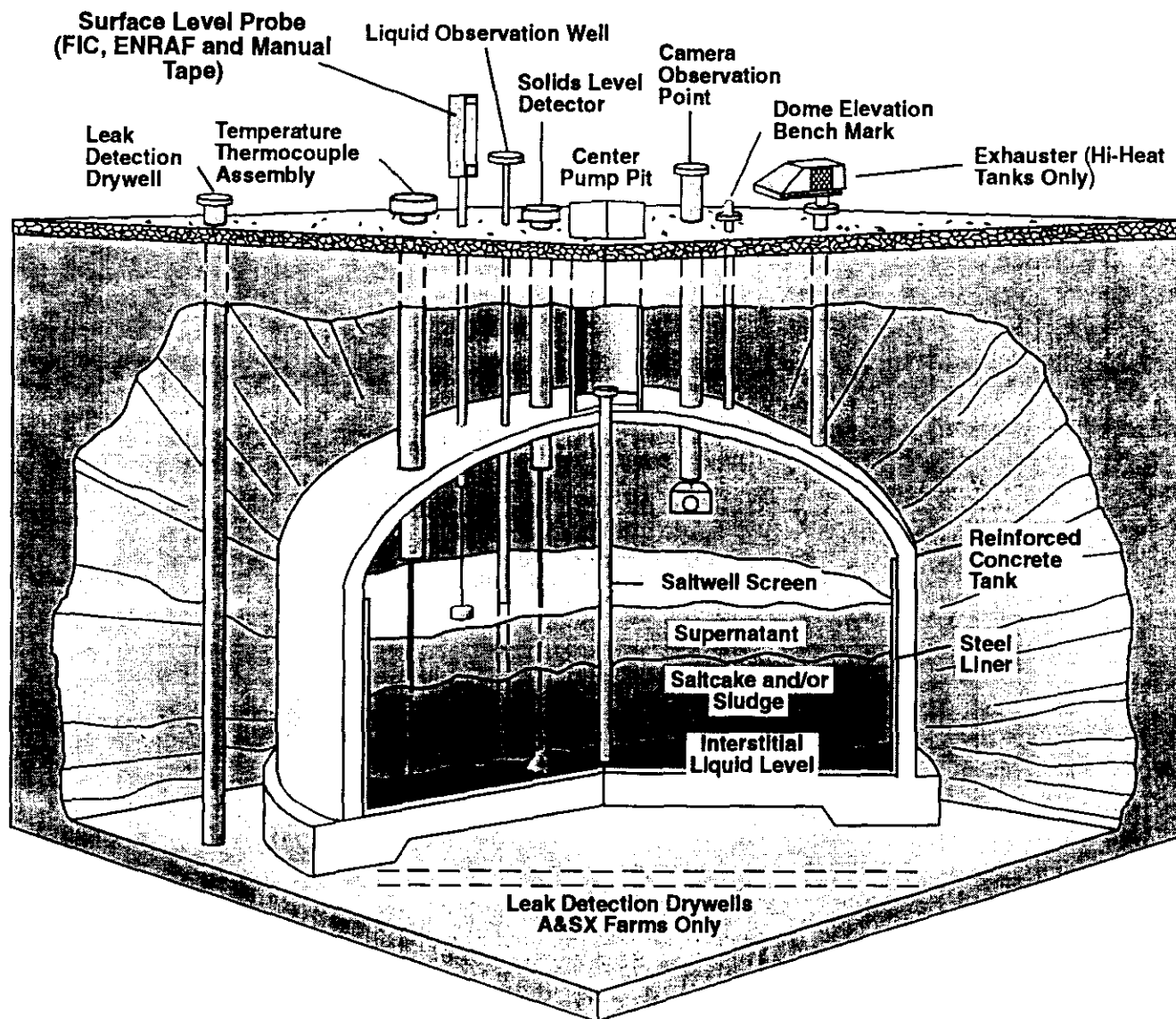


FIGURE D-2. DOUBLE-SHELL TANK INSTRUMENTATION CONFIGURATION



29111046.2B&Wb

FIGURE D-3. SINGLE-SHELL TANK INSTRUMENTATION CONFIGURATION

THE HANFORD TANK FARM FACILITY CHARTS (colored foldouts)
ARE ONLY BEING INCLUDED IN THIS REPORT ON A QUARTERLY BASIS
(i. e., months ending March 31, June 30, September 30, December 31)

NOTE: COPIES OF THE FACILITY CHARTS CAN BE OBTAINED FROM
DENNIS BRUNSON, MULTI-MEDIA SERVICES,
375-6820, K1-03
ALMOST ANY SIZE IS AVAILABLE, AND CAN BE LAMINATED.
CACN/COA required

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APPENDIX E

MONTHLY SUMMARY
TANK USE SUMMARY
PUMPING RECORD, LIQUID STATUS AND PUMPABLE
LIQUID REMAINING IN TANK FARMS
INVENTORY SUMMARY BY TANK FARM
INVENTORY AND STATUS BY TANK

TABLE E-1. MONTHLY SUMMARY

TANK STATUS

November 30, 1998

	200 EAST AREA	200 WEST AREA	TOTAL
IN SERVICE	25	03	28 (1)
OUT OF SERVICE	66	83	149
SOUND	59	51	110
ASSUMED LEAKER	32	35	67
INTERIM STABILIZED	60	59	119 (2)
ISOLATED			
PARTIAL INTERIM	11	30	41
INTRUSION PREVENTION COMPLETE	55	53	108
CONTROLLED, CLEAN, AND STABLE	12	24	36

		WASTE VOLUMES (Kgallons)					
		200	200		SST	DST	
		EAST AREA	WEST AREA	TOTAL	TANKS	TANKS	TOTAL
SUPERNATANT							
AGING	Aging waste	1598	0	1598	0	1598	1598
CC	Complexant concentrate waste	2153	1503	3656	3	3653	3656
CP	Concentrated phosphate waste	1093	0	1093	0	1093	1093
DC	Dilute complexed waste	865	1	866	2	864	866
DN	Dilute non-complexed waste	1917	0	1917	0	1917	1917
DN/PD	Dilute non-complex/PUREX TRU solid	343	0	343	0	343	343
DN/PT	Dilute non-complex/PFP TRU solids	0	865	865	0	865	865
NCPLX	Non-complexed waste	207	277	484	484	0	484
DSSF	Double-shell slurry feed	4413	48	4461	57	4404	4461
TOTAL SUPERNATANT		12589	2694	15283	546	14737	15283
SOLIDS							
	Double-shell slurry	410	0	410	0	410	410
	Sludge	9147	6212	15359	11841	3518	15359
	Saltcake	6265	16740	23005	22926	79	23005
TOTAL SOLIDS		15822	22952	38774	34767	4007	38774
TOTAL WASTE		28411	25646	54057	35313	18744	54057
AVAILABLE SPACE IN TANKS		11979	582	12561	0	12561	12561
DRAINABLE INTERSTITIAL		2229	4615	6844	6565	279	6844
DRAINABLE LIQUID REMAINING		14819	7296	22115	7099	15016	22115

(1) Includes six double-shell tanks on Hydrogen Watch List not currently allowed to receive waste, AN-103, AN-104, AN-105, AW-101, SY-101, and SY-103.

(2) Includes one tank (B-202) which does not meet current established supernatant and interstitial liquid stabilization criteria.

TABLE E-2. TANK USE SUMMARY

November 30, 1998

TANK FARMS	TANKS RECEIVING WASTE TRANSERS	SOUND	ASSUMED LEAKER	PARTIAL INTERIM	ISOLATED TANKS			INTERIM TABILIZED TANKS
					INTRUSION PREVENTION COMPLETED	CONTROLLED CLEAN, AND STABLE		
EAST								
A	0	3	3	2	4	0	5	
AN	7 (1)	7	0	0	0		0	
AP	8	8	0	0	0		0	
AW	6 (1)	6	0	0	0		0	
AX	0	2	2	1	3		3	
AY	2	2	0	0	0		0	
AZ	2	2	0	0	0		0	
B	0	6	10	0	16		16	(2)
BX	0	7	5	0	12	12	12	
BY	0	7	5	5	7		10	
C	0	9	7	3	13		14	
Total	25	59	32	11	55	12	60	
WEST								
S	0	11	1	10	2		4	
SX	0	5	10	6	9		9	
SY	3 (1)	3	0	0	0		0	
T	0	9	7	5	11		14	
TX	0	10	8	0	18	18	18	
TY	0	1	5	0	6	6	6	
U	0	12	4	9	7		8	
Total	3	51	35	30	53	24	59	
TOTAL	28	110	67	41	108	36	119	

(1) Six Double-Shell Tanks on the Hydrogen Tank Watch List are not currently receiving waste transfers (AN-103, 104, 105, AW-101, SY-101 and 103).

(2) Includes tank B-202 which no longer meets established supernatant interstitial liquid stabilization criteria.

TABLE E-3. PUMPING RECORD, LIQUID STATUS AND PUMPABLE
LIQUID REMAINING IN TANK FARMS

November 30, 1998

TANK FARMS	Waste Volumes (K gallons)						
	<u>PUMPED THIS MONTH</u>	<u>PUMPED FY TO DATE</u>	<u>CUMULATIVE TOTAL PUMPED 1979 TO DATE</u>	<u>SUPERNATANT LIQUID</u>	<u>DRAINABLE INTERSTITIAL REMAINING</u>	<u>DRAINABLE LIQUID REMAINING</u>	<u>PUMPABLE LIQUID REMAINING</u>
EAST							
A	0.0	0.0	150.5	9	492	501	441
AN	N/A	N/A	N/A	3715	127	3842	N/A
AP	N/A	N/A	N/A	3599	3	3602	N/A
AW	N/A	N/A	N/A	2952	139	3091	N/A
AX	0.0	0.0	13.0	3	409	412	344
AY	N/A	N/A	N/A	505	5	510	N/A
AZ	N/A	N/A	N/A	1598	5	1603	N/A
B	0.0	0.0	0.0	15	164	179	80
BX	N/A	0.0	200.2	21	107	129	N/A
BY	0.0	0.0	1567.8	0	588	588	431
C	0.0	0.0	103.0	172	190	362	272
Total	0.0	0.0	2034.5	12589	2229	14819	1568
WEST							
S	0.0	0.0	853.6	71	1303	1361	1138
SX	16.1	32.0	170.2	51	1462	1513	1388
SY	N/A	N/A	N/A	2368	0	2368	N/A
T	6.8	16.1	225.6	28	212	240	176
TX	N/A	0.0	1205.7	5	250	255	N/A
TY	N/A	0.0	29.9	3	31	34	N/A
U	0.0	0.0	0.0	168	1357	1525	1377
Total	22.9	48.1	2485.0	2694	4615	7296	4079
TOTAL	22.9	48.1	4519.5	15283	6844 (1)	22115	5647 (1)

(1) Volume based on 21% (sludge waste) and 50% (saltcake waste) liquid in solid (porosity) value, per WHC-SD-W236A-ES-012, Rev .1, dated May 21, 1996, a re-evaluation of the non-stabilized tanks.

N/A = Not applicable for Double-Shell Tank Farms, and Single-Shell Tank Farms which have been declared Controlled, Clean and Stable (BX, TX, TY).

TABLE E-4. INVENTORY SUMMARY BY TANK FARM

November 30, 1998

SUPERNATANT LIQUID VOLUMES (Kgallons)													SOLIDS VOLUME			
TANK FARM	TOTAL WASTE	AVAIL SPACE	AGING	CC	CP	DC	DN	DN/PD	DN/PT	DSSE	NCPLX	TOTAL	DSS	SLUDGE	SALT CAKE	TOTAL
EAST																
A	1537	0	0	0	0	0	0	0	0	9	0	9	0	556	972	1528
AN	5449	2531	0	1798	0	0	125	0	0	1792	0	3715	410	1324	0	1734
AP	3689	5431	0	0	1093	254	459	0	0	1793	0	3599	0	90	0	90
AW	4359	2481	0	352	0	550	888	343	0	819	0	2952	0	1332	75	1407
AX	906	0	0	3	0	0	0	0	0	0	0	3	0	19	884	903
AY	835	1325	0	0	0	60	445	0	0	0	0	505	0	130	0	130
AZ	1749	211	1598	0	0	0	0	0	0	0	0	1598	0	151	0	151
B	2057	0	0	0	0	0	0	0	0	0	15	15	0	1697	345	2042
BX	1493	0	0	0	0	0	0	0	0	0	21	21	0	1351	121	1472
BY	4561	0	0	0	0	0	0	0	0	0	0	0	0	693	3868	4561
C	1976	0	0	0	0	1	0	0	0	0	171	172	0	1804	0	1804
Total	28411	11879	1598	2153	1093	865	1917	343	0	4413	207	12589	410	9147	6265	15822
WEST																
S	5300	0	0	0	0	0	0	0	0	17	54	71	0	1166	4063	5229
SX	4407	0	0	0	0	1	0	0	0	0	50	51	0	1254	3102	4356
SY	2863	582	0	1503	0	0	0	0	865	0	0	2368	0	491	4	495
T	1879	0	0	0	0	0	0	0	0	0	28	28	0	1851	0	1851
TX	7009	0	0	0	0	0	0	0	0	0	5	5	0	241	6763	7004
TY	638	0	0	0	0	0	0	0	0	0	3	3	0	571	64	635
U	3550	0	0	0	0	0	0	0	0	31	137	168	0	638	2744	3382
Total	25646	582	0	1503	0	1	0	0	865	48	277	2694	0	6212	16740	22952
TOTAL	54057	12561	1598	3656	1093	866	1917	343	865	4461	484	15283	410	15359	23005	38774

E-5

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TABLE E-5. INVENTORY AND STATUS BY TANK - DOUBLE SHELL TANKS

November 30, 1998

TANK STATUS							LIQUID VOLUME				SOLIDS VOLUME			VOLUME DETERMINATION			PHOTOS/VIDEOS		SEE FOOTNOTE FOR THESE CHANGES
TANK	WAST MATL	TANK INTEGRITY	TANK USE	EQUIVA- LENT	TOTAL	AVAIL.	SUPER- NATANT (Kgal)	DRAIN- ABLE	DRAIN- ABLE	PUMP- ABLE	DSS (Kgal)	SLUDGE	SALT CAKE	LIQUID VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST IN-TANK PHOTO	LAST IN-TANK VIDEO	
				WASTE	WASTE	SPACE		INTER- STIT.	REMAIN LIQUID	REMAIN LIQUID									
				INCHES	(Kgal)	(Kgal)		(Kgal)	(Kgal)	(Kgal)									
AN TANK FARM STATUS																			
AN-101	DN	SOUND	DRCVR	57.6	158	982	125	0	125	125	0	33	0	FM	S	04/30/96	0/ 0/ 0		
AN-102	CC	SOUND	CWHT	387.3	1065	75	978	3	979	978	0	89	0	FM	S	08/22/89	0/ 0/ 0		
AN-103	DSS	SOUND	CWHT	348.4	958	182	548	0	548	548	410	0	0	FM	S	03/31/97	10/29/87		
AN-104	DSSF	SOUND	CWHT	383.3	1054	86	806	48	653	631	0	449	0	FM	S	03/31/97	08/19/88		
AN-105	DSSF	SOUND	CWHT	410.2	1128	12	639	53	692	670	0	489	0	FM	S	03/31/97	01/26/88		
AN-106	CC	SOUND	CWHT	14.2	39	1101	22	0	22	22	0	17	0	FM	S	08/22/89	0/ 0/ 0		
AN-107	CC	SOUND	CWHT	380.7	1047	93	800	23	823	801	0	247	0	FM	S	08/22/89	09/01/88		
7 DOUBLE-SHELL TANKS				TOTALS	5449	2531	3715	127	3842	3773	410	1324	0						
AP TANK FARM STATUS																			
AP-101	DSSF	SOUND	DRCVR	406.5	1115	25	1115	0	1115	1115	0	0	0	FM	S	05/01/89	0/ 0/ 0		
AP-102	CP	SOUND	GRTFD	397.5	1093	47	1093	0	1093	1093	0	0	0	FM	S	07/11/89	0/ 0/ 0		
AP-103	DN	SOUND	DRCVR	8.7	24	1116	23	0	23	23	0	1	0	FM	S	05/31/96	0/ 0/ 0		
AP-104	DN	SOUND	GRTFD	8.7	24	1116	24	0	24	24	0	0	0	FM	S	10/13/88	0/ 0/ 0		
AP-105	DSSF	SOUND	CWHT	278.9	767	373	678	3	681	678	0	89	0	FM	S	03/31/98	0/ 0/ 0	08/27/95	
AP-106	DN	SOUND	DRCVR	141.5	389	751	389	0	389	389	0	0	0	FM	S	10/13/88	0/ 0/ 0		
AP-107	DN	SOUND	DRCVR	8.4	23	1117	23	0	23	23	0	0	0	FM	S	10/13/88	0/ 0/ 0		
AP-108	DC	SOUND	DRCVR	92.4	254	886	254	0	254	254	0	0	0	FM	S	10/13/88	0/ 0/ 0		
8 DOUBLE-SHELL TANKS				TOTALS	3689	5431	3599	3	3602	3599	0	90	0						
AW TANK FARM STATUS																			
AW-101	DSSF	SOUND	CWHT	409.1	1125	15	819	30	849	827	0	306	0	FM	S	03/31/97	03/17/88		
AW-102	DC	SOUND	EVFD	214.5	590	550	550	0	550	550	0	40	0	FM	S	08/31/97	02/02/83		
AW-103	DN/PD	SOUND	DRCVR	186.2	512	628	185	35	200	178	0	347	0	FM	S	03/31/98	0/ 0/ 0	(a)	
AW-104	DN	SOUND	DRCVR	406.9	1119	21	888	30	918	896	0	156	75	FM	S	03/31/98	02/02/83	(a)	
AW-105	DN/PD	SOUND	DRCVR	157.5	433	707	178	24	202	180	0	255	0	FM	S	03/31/98	0/ 0/ 0	(a)	
AW-106	CC	SOUND	SRCVR	210.9	580	580	352	20	372	352	0	228	0	FM	S	08/31/97	02/02/83		
6 DOUBLE-SHELL TANKS				TOTALS	4359	2481	2952	139	3091	2983	0	1332	75						

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TABLE E-5. INVENTORY AND STATUS BY TANK - DOUBLE SHELL TANKS

November 30, 1998

TANK STATUS							LIQUID VOLUME				SOLIDS VOLUME			VOLUME DETERMINATION			PHOTOS/VIDEOS		SEE FOOTNOTE FOR THESE CHANGES
TANK	WAST MATL	TANK INTEGRITY	TANK USE	EQUIVA- LENT	TOTAL	AVAIL.	SUPER- NATANT LIQUID (Kgal)	DRAIN- ABLE INTER- STIT. (Kgal)	DRAIN- ABLE LIQUID REMAIN (Kgal)	PUMP- ABLE LIQUID REMAIN (Kgal)	DSS (Kgal)	SLUDGE	SALT CAKE	LIQUID VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST IN-TANK PHOTO	LAST IN-TANK VIDEO	
				WASTE	WASTE	SPACE													
				INCHES	(Kgal)	(Kgal)													
<u>AY TANK FARM STATUS</u>																			
AY-101	DC	SOUND	DRCVR	61.1	168	812	60	5	65	60	0	108	0	FM	S	10/31/97	12/28/82		
AY-102	DN	SOUND	DRCVR	169.8	467	513	445	0	445	445	0	22	0	FM	S	10/31/97	04/28/81		
2 DOUBLE-SHELL TANKS				TOTALS	635	1325	505	5	510	505	0	130	0						
<u>AZ TANK FARM STATUS</u>																			
AZ-101	AGING	SOUND	CWHT	308.7	849	131	802	0	802	802	0	47	0	FM	S	10/31/97	08/18/83		
AZ-102	AGING	SOUND	DRCVR	327.3	900	80	796	5	801	796	0	104	0	FM	S	10/31/97	10/24/84		
2 DOUBLE-SHELL TANKS				TOTALS	1749	211	1598	5	1603	1598	0	151	0						
<u>SY TANK FARM STATUS</u>																			
SY-101	CC	SOUND	CWHT	423.6	1165	0	1124	0	1124	1124	0	41	0	FM	S	05/31/96	04/12/89	(b)	
SY-102	DN/PT	SOUND	DRCVR	346.5	953	187	865	0	865	865	0	88	0	FM	S	03/31/98	04/29/81	(a)	
SY-103	CC	SOUND	CWHT	270.9	745	395	379	0	379	379	0	362	4	FM	S	06/30/96	10/01/85		
3 DOUBLE-SHELL TANKS				TOTALS	2863	582	2368	0	2368	2368	0	491	4						
GRAND TOTAL					18744	12561	14737	279	15016	14826	410	3518	79						

Note: +/- 1 Kgal differences are the result of computer rounding

Tank Farms	Available Space Calculations		IOSR WHC-SD-WM-OSR-16 (AN, AP, AW, SY)	
	Used in This Document (Most Conservative)		WHC-T-151-00009 (Aging Waste)	
AN, AP, AW, SY	1,140,000 gal (414.5 in.)		1,144,000 gal (416 in.)(AN, AP, SY)	1,127,500 (410 in.)(AW-Farm)
AY, AZ (Aging Waste)	980,000 gal (356.4 in.)		1,000,000 gal (363.6 in.)(AY, AZ)	

NOTE: Tanks AN-102, AN-107, AY-101, AY-102, AP-103, AP-104, AP-107 - These tanks currently contain waste that is outside of the current corrosion control specification. An alternate strategy of corrosion control (monitor using corrosion probes; adjust chemistry as required for control) is being proposed but has not been fully evaluated. Note that the supemate in AY-102 is within the corrosion specifications, however, the sludge layer is outside the specifications.

(a) Solids levels in tanks AP-105, AW-103, AW-104, AW-105, and SY-102 were adjusted based on document HNF-SD-WM-TI-806, "Safety Control Optimization by Performance Evaluation-Analysis Tool (SCOPE-AT) Pedigree Database for Hanford Tanks," which will soon be released.

(b) Tank SY-101 - Total Waste exceeds the "most conservative" Available Space calculations used for these tanks, but does not exceed the OSR requirements

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TABLE E-6. INVENTORY AND STATUS BY TANK - SINGLE-SHELL TANKS

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TANK STATUS					LIQUID VOLUME						SOLIDS VOLUME		VOLUME DETERMINATION			PHOTOS/VIDEOS		SEE FOOTNOTES FOR THESE CHANGES
TANK	WASTE MAT'L	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATE LIQUID (Kgal)	DRAIN- ABLE INTER- STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN- ABLE LIQUID REMAIN (Kgal)	PUMP- ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALT CAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST IN-TANK PHOTO	LAST IN-TANK VIDEO	
A TANK FARM STATUS																		
A-101	DSSF	SOUND	/PI	953	0	464	0.0	0.0	464	441	3	950	P	F	11/21/80	08/21/85		
A-102	DSSF	SOUND	IS/PI	41	4	2	0.0	39.5	6	0	15	22	P	FP	07/27/89	07/20/89		
A-103	DSSF	ASMD LKR	IS/IP	371	5	15	0.0	111.0	20	0	366	0	-	FP	06/03/88	12/28/88		
A-104	NCPLX	ASMD LKR	IS/IP	28	0	0	0.0	0.0	0	0	28	0	M	PS	01/27/78	06/25/86		
A-105	NCPLX	ASMD LKR	IS/IP	19	0	4	0.0	0.0	4	0	19	0	P	MP	08/23/79	08/20/86		
A-106	CP	SOUND	IS/IP	125	0	7	0.0	0.0	7	0	125	0	P	M	09/07/82	08/19/86		
6 SINGLE-SHELL TANKS				TOTALS	1537	9	492	0.0	150.5	501	441	556	972					
AX TANK FARM STATUS																		
AX-101	DSSF	SOUND	/PI	748	0	359	0.0	0.0	359	338	3	745	P	F	07/16/97	08/18/87		
AX-102	CC	ASMD LKR	IS/IP	39	3	14	0.0	13.0	17	3	7	29	F	S	09/06/88	06/05/89		
AX-103	CC	SOUND	IS/IP	112	0	36	0.0	0.0	36	3	2	110	F	S	08/19/87	08/13/87		
AX-104	NCPLX	ASMD LKR	IS/IP	7	0	0	0.0	0.0	0	0	7	0	P	M	04/28/82	08/18/87		
4 SINGLE-SHELL TANKS				TOTALS:	906	3	409	0.0	13.0	412	344	19	884					
B TANK FARM STATUS																		
B-101	NCPLX	ASMD LKR	IS/IP	113	0	6	0.0	0.0	6	0	113	0	P	F	04/28/82	05/19/83		
B-102	NCPLX	SOUND	IS/IP	32	4	0	0.0	0.0	4	0	18	10	P	F	08/22/85	08/22/85		
B-103	NCPLX	ASMD LKR	IS/IP	59	0	0	0.0	0.0	0	0	59	0	F	F	02/28/86	10/13/88		
B-104	NCPLX	SOUND	IS/IP	371	1	46	0.0	0.0	47	40	301	69	M	M	06/30/85	10/13/88		
B-105	NCPLX	ASMD LKR	IS/IP	306	0	23	0.0	0.0	23	0	40	266	P	MP	12/27/84	05/19/88		
B-106	NCPLX	SOUND	IS/IP	117	1	6	0.0	0.0	7	0	116	0	F	F	03/31/85	02/28/86		
B-107	NCPLX	ASMD LKR	IS/IP	165	1	12	0.0	0.0	13	7	164	0	M	M	03/31/85	02/28/86		
B-108	NCPLX	SOUND	IS/IP	94	0	4	0.0	0.0	4	0	94	0	F	F	05/31/85	05/10/85		
B-109	NCPLX	SOUND	IS/IP	127	0	8	0.0	0.0	8	0	127	0	M	M	04/08/85	04/02/85		
B-110	NCPLX	ASMD LKR	IS/IP	246	1	22	0.0	0.0	23	17	245	0	MP	MP	02/28/85	03/17/88		
B-111	NCPLX	ASMD LKR	IS/IP	237	1	21	0.0	0.0	22	16	236	0	F	F	06/28/86	06/28/86		
B-112	NCPLX	ASMD LKR	IS/IP	33	3	0	0.0	0.0	3	0	30	0	F	F	05/31/85	05/29/85		
B-201	NCPLX	ASMD LKR	IS/IP	29	1	3	0.0	0.0	4	0	28	0	M	M	04/28/82	11/12/86	06/23/95	
B-202	NCPLX	SOUND	IS/IP	27	0	3	0.0	0.0	3	0	27	0	P	M	05/31/85	05/29/85	06/15/95	
B-203	NCPLX	ASMD LKR	IS/IP	51	1	5	0.0	0.0	6	0	50	0	PM	PM	05/31/84	11/13/86		
B-204	NCPLX	ASMD LKR	IS/IP	50	1	5	0.0	0.0	6	0	49	0	P	M	05/31/84	10/22/87		
16 SINGLE-SHELL TANKS				TOTALS	2057	15	164	0.0	0.0	179	80	1697	345					

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TABLE E-6. INVENTORY AND STATUS BY TANK - SINGLE-SHELL TANKS

November 30, 1998

TANK STATUS					LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION			PHOTOS/VIDEOS		SEE FOOTNOTES FOR THESE CHANGES
TANK	WASTE MAT'L.	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATE (Kgal)	DRAIN- ABLE INTER- STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN- ABLE LIQUID REMAIN (Kgal)	PUMP- ABLE LIQUID REMAIN (Kgal)	SALT		LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST IN-TANK PHOTO	LAST IN-TANK VIDEO		
											SLUDGE (Kgal)	CAKE (Kgal)							
<u>BX TANK FARM STATUS</u>																			
BX-101	NCPLX	ASMD LKR	IS/IP/CCS	43	1	0	0.0	0.0	1	0	42	0	P	M	04/28/82	11/24/88	11/10/94		
BX-102	NCPLX	ASMD LKR	IS/IP/CCS	96	0	4	0.0	0.0	4	0	96	0	P	M	04/28/82	09/18/85			
BX-103	NCPLX	SOUND	IS/IP/CCS	68	6	0	0.0	0.0	6	0	62	0	P	F	11/29/83	10/31/86	10/27/94		
BX-104	NCPLX	SOUND	IS/IP/CCS	99	3	30	0.0	17.4	33	27	96	0	F	F	09/22/89	09/21/89			
BX-105	NCPLX	SOUND	IS/IP/CCS	51	5	6	0.0	15.0	11	4	43	3	F	S	09/03/86	10/23/86			
BX-106	NCPLX	SOUND	IS/IP/CCS	38	0	0	0.0	14.0	0	0	38	0	MP	PS	08/01/95	05/19/88	07/17/95		
BX-107	NCPLX	SOUND	IS/IP/CCS	345	1	29	0.0	23.1	30	23	344	0	MP	P	09/18/90	09/11/90			
BX-108	NCPLX	ASMD LKR	IS/IP/CCS	26	0	1	0.0	0.0	1	0	26	0	M	PS	07/31/79	05/05/94			
BX-109	NCPLX	SOUND	IS/IP/CCS	193	0	13	0.0	8.2	13	8	193	0	FP	P	09/17/90	09/11/90			
BX-110	NCPLX	ASMD LKR	IS/IP/CCS	207	3	16	0.0	1.5	19	13	195	9	MP	M	10/31/94	07/15/94	10/13/94		
BX-111	NCPLX	ASMD LKR	IS/IP/CCS	162	1	1	0.0	116.9	3	1	52	109	M	M	04/06/95	05/19/94	02/28/95		
BX-112	NCPLX	SOUND	IS/IP/CCS	165	1	7	0.0	4.1	8	2	164	0	FP	P	09/17/90	09/11/90			
12 SINGLE-SHELL TANKS TOTALS:				1493	21	107	0.0	200.2	129	78	1351	121							
<u>BY TANK FARM STATUS</u>																			
BY-101	NCPLX	SOUND	IS/IP	387	0	5	0.0	35.8	5	0	109	278	P	M	05/30/84	09/19/89			
BY-102	NCPLX	SOUND	IS/PI	277	0	11	0.0	159.0	11	0	0	277	MP	M	05/01/95	09/11/87	04/11/95		
BY-103	NCPLX	ASMD LKR	IS/PI	414	0	38	0.0	95.9	38	32	5	409	MP	M	11/25/87	09/07/89	02/24/97		
BY-104	NCPLX	SOUND	IS/IP	406	0	18	0.0	329.5	18	0	40	366	P	M	04/28/82	04/27/83			
BY-105	NCPLX	ASMD LKR	/PI	503	0	228	0.0	0.0	228	216	44	459	P	MP	07/16/97	07/01/86			
BY-106	NCPLX	ASMD LKR	/PI	642	0	200	0.0	63.7	200	163	95	547	P	MP	04/28/82	11/04/82			
BY-107	NCPLX	ASMD LKR	IS/IP	266	0	25	0.0	56.4	25	0	60	206	P	MP	04/28/82	10/15/86			
BY-108	NCPLX	ASMD LKR	IS/IP	228	0	9	0.0	27.5	9	0	154	74	MP	M	04/28/82	10/15/86			
BY-109	NCPLX	SOUND	IS/PI	290	0	37	0.0	157.1	37	20	57	233	F	PS	07/08/87	06/18/97			
BY-110	NCPLX	SOUND	IS/IP	398	0	9	0.0	213.3	9	0	103	295	M	S	09/10/79	07/26/84			
BY-111	NCPLX	SOUND	IS/IP	459	0	0	0.0	313.2	0	0	21	438	P	M	04/28/82	10/31/86			
BY-112	NCPLX	SOUND	IS/IP	291	0	8	0.0	116.4	8	0	5	286	P	M	04/28/82	04/14/88			
12 SINGLE-SHELL TANKS TOTALS:				4561	0	588	0.0	1567.8	588	431	693	3868							

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TABLE E-6. INVENTORY AND STATUS BY TANK - SINGLE-SHELL TANKS

November 30, 1998

TANK STATUS					LIQUID VOLUME						SOLIDS VOLUME		VOLUME DETERMINATION					SEE FOOTNOTES
TANK	WASTE MAT'L.	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATE (Kgal)	DRAIN- ABLE INTER- STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN- ABLE LIQUID REMAIN (Kgal)	PUMP- ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALT CAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST IN-TANK PHOTO	LAST IN-TANK VIDEO	FOR THESE CHANGES
C TANK FARM STATUS																		
C-101	NCPLX	ASMD LKR	IS/IP	88	0	3	0.0	0.0	3	0	88	0	M	M	11/29/83	11/17/87		
C-102	DC	SOUND	IS/IP	316	0	30	0.0	46.7	30	17	316	0	F	FP	09/30/95	05/18/76	08/24/95	
C-103	NCPLX	SOUND	/PI	195	133	2	0.0	0.0	135	133	62	0	F	S	10/20/90	07/28/87		
C-104	CC	SOUND	IS/IP	295	0	11	0.0	0.0	11	5	295	0	FP	P	09/22/89	07/25/90		
C-105	NCPLX	SOUND	IS/PI	134	2	30	0.0	0.0	32	9	132	0	F	S	10/31/95	08/05/94	08/30/95	
C-106	NCPLX	SOUND	/PI	229	32	30	0.0	0.0	62	52	197	0	F	PS	04/28/82	08/05/94	08/08/94	
C-107	DC	SOUND	IS/IP	237	0	24	0.0	40.8	24	15	237	0	F	S	09/30/95	00/00/00		
C-108	NCPLX	SOUND	IS/IP	66	0	0	0.0	0.0	0	0	66	0	M	S	02/24/84	12/05/74	11/17/94	
C-109	NCPLX	SOUND	IS/IP	66	4	0	0.0	0.0	4	0	62	0	M	PS	11/29/83	01/30/76		
C-110	DC	ASMD LKR	IS/IP	178	1	28	0.0	15.5	29	15	177	0	F	FMP	06/14/95	08/12/86	05/23/95	
C-111	NCPLX	ASMD LKR	IS/IP	57	0	0	0.0	0.0	0	0	57	0	M	S	04/28/82	02/25/70	02/02/95	
C-112	NCPLX	SOUND	IS/IP	104	0	32	0.0	0.0	32	26	104	0	M	PS	09/18/90	09/18/90		
C-201	NCPLX	ASMD LKR	IS/IP	2	0	0	0.0	0.0	0	0	2	0	P	MP	03/31/82	12/02/86		
C-202	EMPTY	ASMD LKR	IS/IP	1	0	0	0.0	0.0	0	0	1	0	P	M	01/19/79	12/09/86		
C-203	NCPLX	ASMD LKR	IS/IP	5	0	0	0.0	0.0	0	0	5	0	P	MP	04/28/82	12/09/86		
C-204	NCPLX	ASMD LKR	IS/IP	3	0	0	0.0	0.0	0	0	3	0	P	MP	04/28/82	12/09/86		
16 SINGLE-SHELL TANKS				TOTALS:	1976	172	190	0.0	103.0	362	272	1804	0					
S TANK FARM STATUS																		
S-101	NCPLX	SOUND	/PI	427	12	126	0.0	0.0	138	127	244	171	F	PS	09/16/80	03/18/88		
S-102	DSSF	SOUND	/PI	549	0	262	0.0	0.0	262	239	4	545	P	FP	04/28/82	03/18/88		
S-103	DSSF	SOUND	/PI	248	17	101	0.0	0.0	118	97	10	221	M	S	11/20/80	06/01/89		
S-104	NCPLX	ASMD LKR	IS/IP	294	1	28	0.0	0.0	29	23	293	0	M	M	12/20/84	12/12/84		
S-105	NCPLX	SOUND	IS/IP	456	0	35	0.0	114.3	35	13	2	454	MP	S	09/26/88	04/12/89		
S-106	NCPLX	SOUND	/PI	479	4	186	0.0	97.0	190	168	28	447	P	FP	12/31/93	03/17/89	09/12/94	
S-107	NCPLX	SOUND	/PI	376	14	85	0.0	0.0	99	88	293	69	F	PS	09/25/80	03/12/87		
S-108	NCPLX	SOUND	IS/PI	450	0	4	0.0	199.8	4	0	4	446	P	MP	12/20/96	03/12/87	12/03/96	
S-109	NCPLX	SOUND	/PI	568	0	141	0.0	111.0	141	119	13	555	F	PS	09/30/75	08/24/84		
S-110	NCPLX	SOUND	IS/PI	390	0	30	0.0	203.1	30	23	131	259	F	PS	05/14/92	03/12/87	12/11/96	
S-111	NCPLX	SOUND	/PI	540	23	195	0.0	3.3	205	134	139	378	P	FP	06/30/97	08/10/89		
S-112	NCPLX	SOUND	/PI	523	0	110	0.0	125.1	110	107	5	518	P	FP	12/31/93	03/24/87		
12 SINGLE-SHELL TANKS				TOTALS:	5300	71	1303	0.0	853.6	1361	1138	1166	4063					

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TABLE E-6. INVENTORY AND STATUS BY TANK - SINGLE-SHELL TANKS

November 30, 1998

TANK STATUS					LIQUID VOLUME						SOLIDS VOLUME		VOLUME DETERMINATION					SEE FOOTNOTES FOR THESE CHANGES
TANK	WASTE MAT'L.	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATE (Kgal)	DRAIN- ABLE INTER- STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN- ABLE LIQUID REMAIN (Kgal)	PUMP- ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALT CAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST IN-TANK PHOTO	LAST IN-TANK VIDEO	
SX TANK FARM STATUS																		
SX-101	DC	SOUND	/PI	456	1	184	0.0	0.0	185	174	112	343	P	FP	04/28/82	03/10/89		
SX-102	DSSF	SOUND	/PI	543	0	226	0.0	0.0	226	216	117	428	P	M	04/28/82	01/07/88		
SX-103	NCPLX	SOUND	/PI	652	1	281	0.0	0.0	282	272	115	536	F	S	07/15/91	12/17/87		
SX-104	DSSF	ASMD LKR	/PI	614	0	156	14.2	158.5	156	150	136	478	F	S	07/07/89	09/08/88	02/04/98	(a)
SX-105	DSSF	SOUND	/PI	683	0	309	0.0	0.0	309	299	73	610	P	F	04/28/82	06/15/88		
SX-106	NCPLX	SOUND	/PI	526	49	224	1.9	11.7	273	252	12	465	F	PS	11/30/88	06/01/89		(b)
SX-107	NCPLX	ASMD LKR	IS/IP	104	0	5	0.0	0.0	5	0	104	0	P	M	04/28/82	03/06/87		
SX-108	NCPLX	ASMD LKR	IS/IP	87	0	5	0.0	0.0	5	0	87	0	P	M	12/31/93	03/06/87		
SX-109	NCPLX	ASMD LKR	IS/IP	244	0	48	0.0	0.0	48	25	0	244	P	M	01/10/96	05/21/86		
SX-110	NCPLX	ASMD LKR	IS/IP	82	0	0	0.0	0.0	0	0	82	0	M	PS	10/06/76	02/20/87		
SX-111	NCPLX	ASMD LKR	IS/IP	125	0	7	0.0	0.0	7	0	125	0	M	PS	05/31/74	06/09/94		
SX-112	NCPLX	ASMD LKR	IS/IP	92	0	3	0.0	0.0	3	0	92	0	P	M	04/28/82	03/10/87		
SX-113	NCPLX	ASMD LKR	IS/IP	26	0	0	0.0	0.0	0	0	26	0	P	M	04/28/82	03/18/88		
SX-114	NCPLX	ASMD LKR	IS/IP	181	0	14	0.0	0.0	14	0	181	0	P	M	04/28/82	02/26/87		
SX-115	NCPLX	ASMD LKR	IS/IP	12	0	0	0.0	0.0	0	0	12	0	P	M	04/28/82	03/31/88		
15 SINGLE-SHELL TANKS TOTALS:				4407	51	1462	16.1	170.2	1513	1388	1254	3102						

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T TANK FARM STATUS

T-101	NCPLX	ASMD LKR	IS/PI	102	1	16	0.0	25.3	17	0	101	0	F	S	04/14/93	04/07/93		
T-102	NCPLX	SOUND	IS/IP	32	13	0	0.0	0.0	13	13	19	0	P	FP	08/31/84	06/28/89		
T-103	NCPLX	ASMD LKR	IS/IP	27	4	0	0.0	0.0	4	0	23	0	F	FP	11/29/83	07/03/84		
T-104	NCPLX	SOUND	/PI	332	0	48	3.2	142.6	48	45	332	0	P	MP	11/30/98	06/29/89		
T-105	NCPLX	SOUND	IS/IP	98	0	23	0.0	0.0	23	17	98	0	P	F	05/29/87	05/14/87		
T-106	NCPLX	ASMD LKR	IS/IP	21	2	0	0.0	0.0	2	0	19	0	P	FP	04/28/82	06/29/89		
T-107	NCPLX	ASMD LKR	IS/PI	173	0	22	0.0	11.0	22	12	173	0	P	FP	05/31/96	07/12/84	05/09/96	
T-108	NCPLX	ASMD LKR	IS/IP	44	0	0	0.0	0.0	0	0	44	0	P	M	04/28/82	07/17/84		

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TABLE E-6. INVENTORY AND STATUS BY TANK - SINGLE-SHELL TANKS

November 30, 1998

TANK STATUS					LIQUID VOLUME						SOLIDS VOLUME		VOLUME DETERMINATION					SEE FOOTNOTES FOR THESE CHANGES
TANK	WASTE MAT'L	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATE (Kgal)	DRAIN- ABLE INTER- STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN- ABLE LIQUID REMAIN (Kgal)	PUMP- ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALT CAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST IN-TANK PHOTO	LAST IN-TANK VIDEO	
T-109	NCPLX	ASMD LKR	IS/IP	58	0	0	0.0	0.0	0	0	58	0	M	M	12/30/84	02/25/93	(d)	
T-110	NCPLX	SOUND	/PI	356	0	58	3.6	37.1	58	53	356	0	P	FP	11/30/98	07/12/84		
T-111	NCPLX	ASMD LKR	IS/PI	446	0	34	0.0	9.6	34	29	446	0	P	FP	04/18/94	04/13/94		
T-112	NCPLX	SOUND	IS/IP	67	7	0	0.0	0.0	7	7	60	0	P	FP	04/28/82	08/01/84		
T-201	NCPLX	SOUND	IS/IP	29	1	3	0.0	0.0	4	0	28	0	M	PS	06/31/78	04/15/86		
T-202	NCPLX	SOUND	IS/IP	21	0	2	0.0	0.0	2	0	21	0	FP	P	07/12/81	07/08/89		
T-203	NCPLX	SOUND	IS/IP	35	0	4	0.0	0.0	4	0	35	0	M	PS	01/31/78	08/03/89		
T-204	NCPLX	SOUND	IS/IP	38	0	4	0.0	0.0	4	0	38	0	FP	P	07/22/81	08/03/89		
16 SINGLE-SHELL TANKS TOTALS:				1879	28	212	6.8	225.6	240	176	1851	0						
TX TANK FARM STATUS																		
TX-101	NCPLX	SOUND	IS/IP/CCS	87	3	2	0.0	0.0	5	0	84	0	F	P	02/02/84	10/24/85	(d)	
TX-102	NCPLX	SOUND	IS/IP/CCS	217	0	22	0.0	94.4	22	0	0	217	M	S	08/31/84	10/31/85		
TX-103	NCPLX	SOUND	IS/IP/CCS	157	0	15	0.0	68.3	15	0	157	0	F	S	08/14/80	10/31/85		
TX-104	NCPLX	SOUND	IS/IP/CCS	65	1	14	0.0	3.6	15	0	0	64	F	FP	04/06/84	10/16/84		
TX-105	NCPLX	ASMD LKR	IS/IP/CCS	609	0	20	0.0	121.5	20	0	0	609	M	PS	08/22/77	10/24/89		
TX-106	NCPLX	SOUND	IS/IP/CCS	453	0	10	0.0	134.6	10	0	0	453	M	S	08/29/77	10/31/85		
TX-107	NCPLX	ASMD LKR	IS/IP/CCS	36	1	1	0.0	0.0	2	0	0	35	FP	FP	01/20/84	10/31/85		
TX-108	NCPLX	SOUND	IS/IP/CCS	134	0	0	0.0	13.7	0	0	0	134	P	FP	05/30/83	09/12/89		
TX-109	NCPLX	SOUND	IS/IP/CCS	384	0	10	0.0	72.3	10	0	0	384	F	PS	05/30/83	10/24/89		
TX-110	NCPLX	ASMD LKR	IS/IP/CCS	462	0	15	0.0	115.1	15	0	0	462	M	PS	05/30/83	10/24/89		
TX-111	NCPLX	SOUND	IS/IP/CCS	370	0	9	0.0	98.4	9	0	0	370	M	PS	07/26/77	09/12/89		
TX-112	NCPLX	SOUND	IS/IP/CCS	649	0	24	0.0	94.0	24	0	0	649	P	PS	05/30/83	11/19/87		
TX-113	NCPLX	ASMD LKR	IS/IP/CCS	607	0	16	0.0	19.2	16	0	0	607	M	PS	05/30/83	04/11/83		
TX-114	NCPLX	ASMD LKR	IS/IP/CCS	535	0	15	0.0	104.3	15	0	0	535	M	PS	05/30/83	04/11/83		
TX-115	NCPLX	ASMD LKR	IS/IP/CCS	640	0	19	0.0	99.1	19	0	0	640	M	S	03/25/83	06/15/88		
TX-116	NCPLX	ASMD LKR	IS/IP/CCS	631	0	23	0.0	23.8	23	0	0	631	M	PS	03/31/72	10/17/89		
TX-117	NCPLX	ASMD LKR	IS/IP/CCS	626	0	8	0.0	54.3	8	0	0	626	M	PS	12/31/71	04/11/83		
TX-118	NCPLX	SOUND	IS/IP/CCS	347	0	27	0.0	89.1	27	0	0	347	F	S	11/17/80	12/19/79		
18 SINGLE-SHELL TANKS TOTALS:				7009	5	250	0.0	1205.7	255	0	241	6763						

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TABLE E-6. INVENTORY AND STATUS BY TANK - SINGLE-SHELL TANKS

November 30, 1998

TANK STATUS					LIQUID VOLUME						SOLIDS VOLUM		VOLUME DETERMINATION			PHOTOS/VIDEOS		SEE FOOTNOTES FOR THESE CHANGES
TANK	WASTE MAT'L.	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATE LIQUID (Kgal)	DRAIN- ABLE INTER- STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN- ABLE LIQUID REMAIN (Kgal)	PUMP- ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALT CAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST IN-TANK PHOTO	LAST IN-TANK VIDEO	
TY TANK FARM STATUS																		
TY-101	NCPLX	ASMD LKR	IS/IP/CCS	118	0	0	0.0	8.2	0	0	118	0	P	F	04/28/82	08/22/89		
TY-102	NCPLX	SOUND	IS/IP/CCS	64	0	14	0.0	6.6	14	0	0	64	P	FP	06/28/82	07/07/87		
TY-103	NCPLX	ASMD LKR	IS/IP/CCS	162	0	5	0.0	11.5	5	0	162	0	P	FP	07/09/82	08/22/89		
TY-104	NCPLX	ASMD LKR	IS/IP/CCS	46	3	12	0.0	0.0	15	0	43	0	P	FP	06/27/90	11/03/87		
TY-105	NCPLX	ASMD LKR	IS/IP/CCS	231	0	0	0.0	3.6	0	0	231	0	P	M	04/28/82	09/07/89		
TY-106	NCPLX	ASMD LKR	IS/IP/CCS	17	0	0	0.0	0.0	0	0	17	0	P	M	04/28/82	08/22/89		
6 SINGLE-SHELL TANKS TOTALS:				638	3	31	0.0	29.9	34	0	571	64						
U TANK FARM STATUS																		
U-101	NCPLX	ASMD LKR	IS/IP	25	3	0	0.0	0.0	3	0	22	0	P	MP	04/28/82	06/19/79		
U-102	NCPLX	SOUND	/PI	374	18	154	0.0	0.0	172	160	43	313	P	MP	04/28/82	06/08/89		
U-103	NCPLX	SOUND	/PI	468	13	207	0.0	0.0	220	205	32	423	P	FP	04/28/82	09/13/88		
U-104	NCPLX	ASMD LKR	IS/IP	122	0	7	0.0	0.0	7	0	122	0	P	MP	04/28/82	08/10/89		
U-105	NCPLX	SOUND	/PI	418	37	170	0.0	0.0	207	192	32	349	FM	PS	09/30/78	07/07/88		
U-106	NCPLX	SOUND	/PI	226	15	87	0.0	0.0	102	85	26	185	F	PS	12/30/93	07/07/88		
U-107	DSSF	SOUND	/PI	406	31	172	0.0	0.0	203	183	15	360	F	S	12/30/93	10/27/88		
U-108	NCPLX	SOUND	/PI	468	24	202	0.0	0.0	228	209	29	415	F	S	12/30/93	09/12/84		
U-109	NCPLX	SOUND	/PI	463	19	197	0.0	0.0	216	205	48	396	F	F	06/30/96	07/07/88		
U-110	NCPLX	ASMD LKR	IS/PI	186	0	15	0.0	0.0	15	9	186	0	M	M	12/30/84	12/11/84		
U-111	DSSF	SOUND	/PI	329	0	146	0.0	0.0	146	129	26	303	PS	FPS	02/10/84	06/23/88		
U-112	NCPLX	ASMD LKR	IS/IP	49	4	0	0.0	0.0	4	0	45	0	P	MP	02/10/84	08/03/89		
U-201	NCPLX	SOUND	IS/IP	5	1	0	0.0	0.0	1	0	4	0	M	S	08/15/79	08/08/89		
U-202	NCPLX	SOUND	IS/IP	5	1	0	0.0	0.0	1	0	4	0	M	S	08/15/79	08/08/89		
U-203	NCPLX	SOUND	IS/IP	3	1	0	0.0	0.0	1	0	2	0	M	S	08/15/79	06/13/89		
U-204	NCPLX	SOUND	IS/IP	3	1	0	0.0	0.0	1	0	2	0	M	S	08/15/79	06/13/89		
16 SINGLE-SHELL TANKS TOTALS:				3550	168	1357	0.0	0.0	1525	1377	638	2744						
GRAND TOTAL				35313	546	6565	22.9	4519.5	7099	5725	11841	22926						

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TABLE E-6 INVENTORY AND STATUS BY TANK - SINGLE-SHELL TANKS

November 30, 1998

FOOTNOTES:

Total Waste is calculated as the sum of Sludge and Saltcake plus Supernate.

The category "Interim Isolated" (II) was changed to "Intrusion Prevention" (IP) in June 1993. See section C. "Tank and Equipment Code and Status Definitions."

Stabilization information from WHC-SD-RE-TI-178 SST STABILIZATION RECORD, latest revision, or SST Stabilization or Cognizant Engineer

(a) SX-104 Following information from Cognizant Engineer

Pumping resumed on October 7 and was shut down several periods during October and November for transfer of waste from DCRT to SY-102, and to perform the 244-S integrity assessment. Pumping may be interrupted during December to install a new jumbo in a valve pit, and to relocate the alarm circuitry for some of the leak detectors in the transfer line.

Total Waste: 614 Kgal
Supernate: 0 Kgal
Drainable Interstitial: 155.5 Kgal
Pumped this month: 14.2 Kgal
Total Pumped: 158.5 Kgal
Drainable Liquid Remaining: 155.5 Kgal
Pumpable Liquid Remaining: 149.5 Kgal
Sludge: 136 Kgal
Saltcake: 478 Kgal

26,326 gal of dilution water and 2,435 gal of water for transfer line flushes was used during November pumping operations.

(b) SX-106 Following information from Cognizant Engineer

Pumping began on October 7 and was shut down several periods during October and November for transfer of waste from DCRT to SY-102, and repair of a valve.

Total Waste: 526 Kgal
Supernate: 49.3 Kgal
Drainable Interstitial: 224 Kgal
Pumped this month: 1.9 Kgal
Total Pumped: 11.7 Kgal
Drainable Liquid Remaining: 273.3 Kgal
Pumpable Liquid Remaining: 252.3 Kgal
Sludge: 12 Kgal
Saltcake: 465 Kgal

1,372 gal of dilution water and 976 gal of water for transfer line flushes was used during November pumping operations.

TABLE E-6. INVENTORY AND STATUS BY TANK - SINGLE-SHELL TANKS

November 30, 1998

FOOTNOTES:

- (c) T-104 Following information from Cognizant Engineer
Pumping resumed June 7, 1998.

Total Waste: 332 Kgal
Supernate: 0 Kgal
Drainable Interstitial: 47.7 Kgal
Pumped this month: 3.2 Kgal
Total Pumped: 142.6 Kgal
Drainable Liquid Remaining: 47.7 Kgal
Pumpable Liquid Remaining: 44.7 Kgal
Sludge: 332 Kgal
Saltcake: 0 Kgal

Actual volume of liquid remaining to be pumped is still a rough estimate. Volumes will be corrected as porosity data becomes available with continued pumping.
362 gal of raw water was used during November pumping operations.
A correction was required due to continued accumulation on the totalizer during shutdown periods; the correction for November was 805 gal.

- (c) T-110 Following information from Cognizant Engineer
Pumping began May 21, 1997.

Total Waste: 356 Kgal
Supernate: 0 Kgal
Drainable Interstitial: 56.4 Kgal
Pumped this month: 3.6 Kgal
Total Pumped: 37.1 Kgal
Drainable Liquid Remaining: 56.4 Kgal
Pumpable Liquid Remaining: 53.4 Kgal
Sludge: 356 Kgal
Saltcake: 0 Kgal

Actual volume of liquid remaining to be pumped is still a rough estimate. Volumes will continue to be corrected as porosity data becomes available with continued pumping.
932 gal of raw water was used during November pumping operations.
Dome elevation survey performed October 27, 1998; to correct "L" value to 41,053 on Data Sheet 2b with next procedure PCA.

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APPENDIX F

PERFORMANCE SUMMARY

TABLE F-1. PERFORMANCE SUMMARY (Sheet 1 of 2)

WASTE VOLUMES (K gallons)

November 30, 1998

INCREASES/DECREASES IN WASTE VOLUMES
STORED IN DOUBLE-SHELL TANKSCUMULATIVE EVAPORATION - 1950 TO PRESENT
WASTE VOLUME REDUCTION

SOURCE	THIS MONTH	FY1999 TO DATE	FACILITY	
B PLANT	0	0	242-B EVAPORATOR (10)	7172
PUREX TOTAL (1)	0	0	242-T EVAPORATOR (1950's) (10)	9181
PFP (1)	0	0	IN-TANK SOLIDIFICATION UNIT 1 (10)	11876
T PLANT (1)	0	0	IN-TANK SOLIDIFICATION UNIT 2 (10)	15295
S PLANT (1)	0	0	IN-TANK SOLID. UNIT 1 & 2 (10)	7965
300 AREAS (1)	0	0	(after conversion of Unit 1 to a cooler for Unit 2)	8833
400 AREAS (1)	0	0	242-T (Modified) (10)	24471
SULFATE WASTE -100 N (2)	0	0	242-S EVAPORATOR (10)	41983
C-106 SOLIDS (INCLUDING FLUSH)	9	9	242-A EVAPORATOR (11)	73689
TRAINING/X-SITE (9)	0	0	242-A Evaporator was restarted April 15, 1994,	
TANK FARMS (6)	1	5	after having been shut down since April 1989.	
SALTWELL LIQUID (8)	42	111	Total waste reduction since restart:	9486
OTHER GAINS	24	38	Campaign 94-1	2417 Kgal
Slurry increase (3)	7		Campaign 94-2	2787 Kgal
Condensate	17		Campaign 95-1	2161 Kgal
Instrument change (7)	0		Campaign 96-1	1117 Kgal
Unknown (5)	0		Campaign 97-1	351 Kgal
OTHER LOSSES	-7	-17	Campaign 97-2	653 Kgal
Slurry decrease (3)	-2			
Evaporation (4)	-2			
Instrument change (7)	0			
Unknown (5)	-3			
EVAPORATED	0	0		
GROUTED	0	0		
TOTAL	69	146		

Note: No waste due to BIO (Basis for Interim Operation) implementation

TABLE F-1. PERFORMANCE SUMMARY
(Sheet 2 of 2)

Footnotes:

INCREASES/DECREASES IN WASTE VOLUMES

- (1) Including flush
- (2) Sulfate waste is generated from ion exchange backflushing and sand filter clean out, resulting in sulfate waste.
- (3) Slurry increase/growth is caused by gas generation within the waste.
- (4) Aging waste tanks
- (5) Unknown waste gains or losses
- (6) Includes Tank Farms miscellaneous flushes
- (7) Liquid level measurement instrument changes from the automatic FIC to manual tape (and vice versa) result in unusual gains or losses because the manual tape may rest on an uneven crust surface giving a different reading from that of the automatic FIC.
- (8) Results from pumping of single-shell tanks to double-shell tanks.
- (9) Tracks waste being sent to the double-shell tanks from the "Precampaign Training Run." Evaporator procedures require a training run at least once per year. This also includes pressure testing and flushing of cross-site transfer lines.

WASTE VOLUME REDUCTION

- (10) Currently inoperative.
- (11) Currently operative. The 242-A Evaporator-Crystallizer was started up March 1977, and shut down April 1989 because of regulatory issues, and remained shut down for subsequent upgrading. This evaporator operates under a vacuum, employing evaporative concentration with subsequent crystallization and precipitation of salt crystals (forming saltcake). The evaporator was restarted on April 15, 1994.

TABLE F-2. SUMMARY OF WASTE TRANSACTIONS IN THE DOUBLE-SHELL TANKS

**SUMMARY OF WASTE TRANSACTIONS IN THE DOUBLE-SHELL TANK (DST) SYSTEM FOR NOVEMBER 1998:
ALL VOLUMES IN KGALS**

- The DST system received waste transfers/additions from Tank Farms, SST Stabilization and Tank 106-C solids retrieval in November.
- There was a net change of +69 Kgals in the DST system for November 1998.
- The total DST inventory as of November 30, 1998 was 18,744 Kgals.
- There was no Saltwell Liquid (SWL) pumped to the East Area DSTs in November.
- There was 42 Kgals of Saltwell Liquid (SWL) pumped to the West Area DSTs (102-SY) in November.
- There was ~ 9 Kgals of solids pumped from Tank 106-C to Tank 102-AY in November.
- The projected SWL pumping volumes were changed in November. The projected SWL pumping volumes are assumed to change again once SST stabilization engineers finish their evaluation.

NOVEMBER 1998 DST WASTE RECEIPTS					
FACILITY GENERATIONS		OTHER GAINS ASSOCIATED WITH		OTHER LOSSES ASSOCIATED WITH	
SWL (West)	+42 Kgal (2SY)	SLURRY	+7 Kgal	SLURRY	-2 Kgal
Tank Farms	+1 Kgal (2AW)	CONDENSATE	+17 Kgal	CONDENSATE	-2 Kgal
Tank 106-C Solids	+9 Kgal (2AY)	INSTRUMENTATION	+0 Kgal	INSTRUMENTATION	-0 Kgal
TOTAL	+52 Kgal	UNKNOWN	+0 Kgal	UNKNOWN	-3 Kgal
		TOTAL	+24 Kgal	TOTAL	-7 Kgal

	ACTUAL DST WASTE RECEIPTS	PROJECTED DST WASTE RECEIPTS	MISC. DST CHANGES (+/-)	WVR	NET DST CHANGE	TOTAL DST VOLUME
OCT98	73	81	4	0	77	18675
NOV98	52	115	17	0	69	18744
DEC98		128		0		
JAN99		113		0		
FEB99		95		0		
MAR99		153		0		
APR99		-838		0		
MAY99		180		0		
JUN99		231		0		
JUL99		186		0		
AUG99		119		0		
SEP99		142		0		

NOTE: The "PROJECTED DST WASTE RECEIPTS" numbers were updated in November 1998.

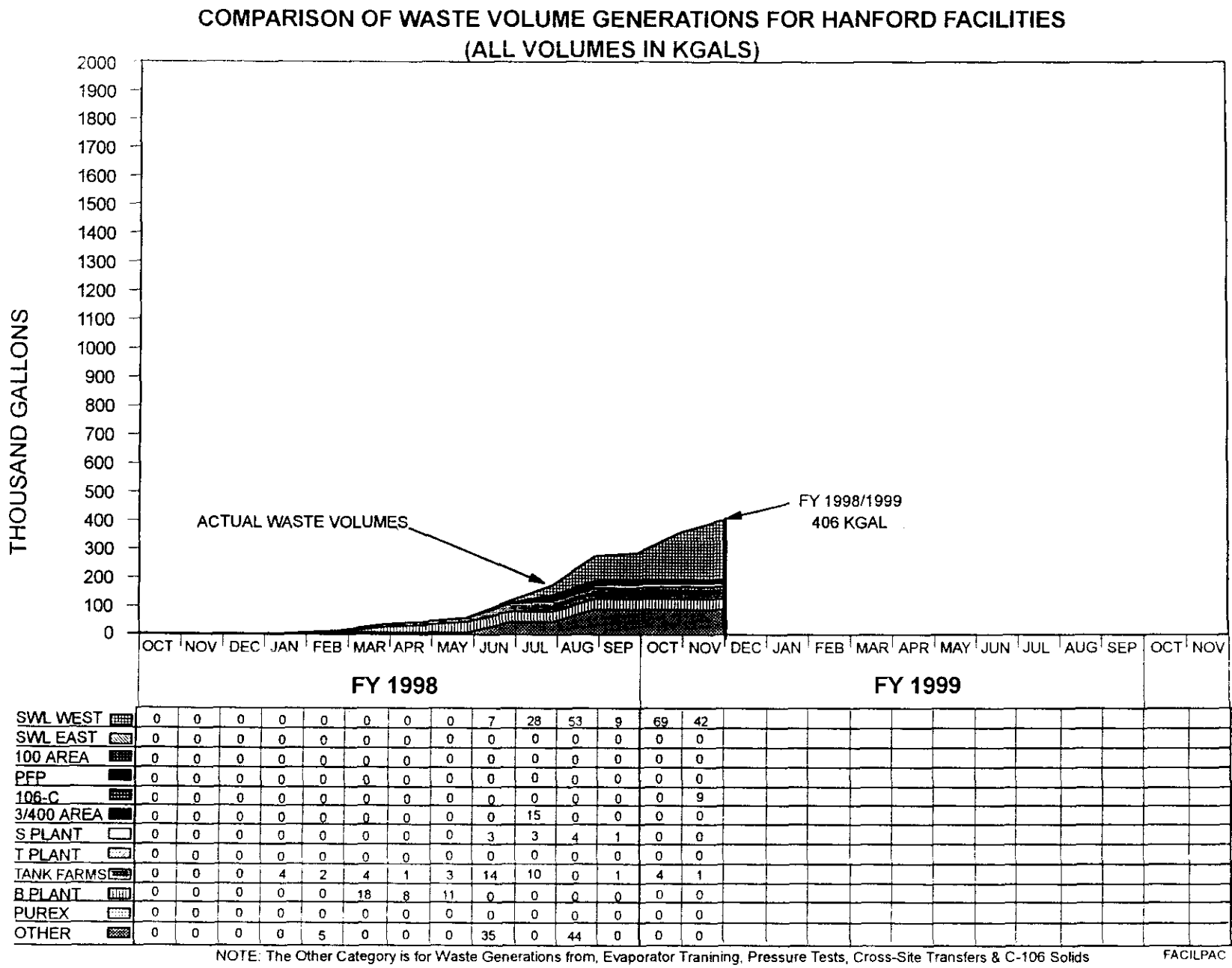


FIGURE F-1. COMPARISON OF WASTE VOLUME GENERATIONS FOR HANFORD FACILITIES
(All volumes in Kgals)

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APPENDIX G

MISCELLANEOUS UNDERGROUND STORAGE TANKS
AND SPECIAL SURVEILLANCE FACILITIES

**TABLE G-1. EAST AND WEST AREA MISCELLANEOUS UNDERGROUND STORAGE TANKS
AND SPECIAL SURVEILLANCE FACILITIES**

ACTIVE - still running transfers through the associated diversion boxes or pipeline encasements

November 30, 1998

<u>FACILITY</u>	<u>LOCATION</u>	<u>PURPOSE (receives waste from:)</u>	<u>(Gallons)</u>	<u>MONITORED BY</u>	<u>REMARKS</u>
EAST AREA					
241-A-302-A	A Farm	A-151 DB	965	SACS/ENRAF	Foamed over Catch Tank pump pit & div. box to prevent intrusion
241-ER-311	B Plant	ER-151, ER-152 DB	6723	SACS/CASS/FIC	Rain
241-AX-152	AX Farm	AX-152 DB	43	SACS/MT	Pumped 11/98
241-AZ-151	AZ Farm	AZ-702 condensate	2905	SACS/CASS/FIC	Volume changes daily - pumped to AZ-102 as needed
241-AZ-154	AZ Farm		25	SACS/CASS/MT	
244-BX-TK/SMP	BX Complex	DCRT - Receives from several farms	24209	SACS/MANUALLY	Using Manual Tape for tank
244-A-TK/SMP	A Complex	DCRT - Receives from several farms	6821	MCS/SACS/WTF	WTF
A-350	A Farm	Collects drainage	364	MCS/SACS/WTF	WTF pumped as needed
AR-204	AY Farm	RR Cars during transfer to rec. tanks	300	DIP TUBE	Alarms on CASS
A-417	A Farm		11757	SACS/DIP TUBE	WTF - pumped 4/98
CR-003-TK/SUMP	C Farm	DCRT	3985	MT/ZIP CORD	Zip cord in sump O/S 3/11/96, water intrusion, 1/98
WEST AREA					
241-TX-302-C	TX Farm	TX-154 DB	361	SACS/CASS/ENRAF	
241-U-301-B	U Farm	U-151, U-152, U-153, U-252 DB	8138	SACS/CASS/ENRAF	Returned to service 12/30/93
241-UX-302-A	U Plant	UX-154 DB	1972	SACS/CASS/ENRAF	
241-S-304	S Farm	S-151 DB	158	SACS/CASS/ENRAF	Replaced S-302-A, 10/91; ENRAF installed 7/98
244-S-TK/SMP	S Farm	DCRT - Receives from several farms	6683	SACS/MANUALLY	Sump not alarming.
244-TX-TK/SMP	TX Farm	DCRT - Receives from several farms	17911	SACS/MANUALLY	CWF
Vent Station Catch Tank		Cross Country Transfer Line	337	SACS/MANUALLY	MT
Total Active Facilities			18		

Note: Readings may be taken manually or automatically by FIC (or ENRAF). All FICs and manual ENRAFs connected to CASS. All tanks on CASS (either auto or manual) are also on the SACS database. If automatic connections to CASS are broken, readings are taken manually. Manual readings include readings taken by manual tape, manual FIC, or manual readings of automatic FIC (if CASS is printing "0"). Readings may also be taken by zip cord, which are acceptable but less accurate.

LEGEND: DB - Diversion Box
DCRT - Double-Contained Receiver Tank
TK - Tank
SMP - Sump
FIC - Food Instrument Corporation measurement device
RS - Robert Shaw Instrument measurement device
MFC - Manual FIC
MT - Manual Tape
CWF - Weight Factor SpB = Corrected Weight Factor
CASS - Computer Automated Surveillance System
SACS - Surveillance Automated Control System
MCS - Monitor and Control System
O/S - Out of Service
ENRAF - Surface Level Measuring Device

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TABLE G-2. EAST AREA INACTIVE MISC. UNDERGROUND STORAGE TANKS AND SPECIAL SURV. FACILITIES

INACTIVE - no longer receiving waste transfers

November 30, 1998

<u>FACILITY</u>	<u>LOCATION</u>	<u>RECEIVED WASTE FROM:</u>	<u>(Gallons)</u>	<u>MONITORED BY</u>	<u>REMARKS</u>
216-BY-201	BY Farm	TBP Waste Line	Unknown	NM	(216-BY)
241-A-302-B	A Farm	A-152 DB	5681	CASS/MT	Isolated 1985, Project B-138 Interim Stabilized 1990, Rain intrusion
241-AX-151	N of PUREX	PUREX	Unknown	NM	Isolated 1985
241-B-301-B	B Farm	B-151, B-152, B-153, B-252 DB	22250	NM	Isolated 1985 (1)
241-B-302-B	B Farm	B-154 DB	4930	NM	Isolated 1985 (1)
241-BX-302-A	BX Farm	BR-152, BX-153, BXR-152, BYR-152 DB	840	NM	Isolated 1985 (1)
241-BX-302-B	BX Farm	BX-154 DB	1040	NM	Isolated 1985 (1)
241-BX-302-C	BX Farm	BX-155 DB	870	NM	Isolated 1985 (1)
241-C-301-C	C Farm	C-151, C-152, C-153, C-252 DB	10470	NM	Isolated 1985 (1)
241-CX-70	Hot Semi-	Transfer lines	Unknown	NM	Isolated, Decommission Project,
241-CX-72	Works	Transfer lines	650	NM	See Dwg H-2-95-501, 2/5/87
241-ER-311A	SW B Plant	ER-151 DB	Unknown	NM	Isolated
244-AR VAULT	A Complex	Between farms & B-Plant	Unknown	NM	Not actively being used. Systems activated for final clean-out.
244-BXR-TK/SMP-001	BX Farm	Transfer lines	7200	NM	Interim Stabilization 1985 (1)
244-BXR-TK/SMP-002	BX Farm	Transfer lines	2180	NM	Interim Stabilization 1985 (1)
244-BXR-TK/SMP-003	BX Farm	Transfer lines	1810	NM	Interim Stabilization 1985 (1)
244-BXR-TK/SMP-011	BX Farm	Transfer lines	7100	NM	Interim Stabilization 1985 (1)
361-B-TANK	B Plant	Drainage from B-Plant	Unknown	NM	Interim Stabilization 1985 (1)

Total East Area inactive facilities	18
-------------------------------------	----

LEGEND:	DB - Diversion Box
	DCRT - Double-Contained Receiver Tank
	MT - Manual Tape
	CASS - Computer Automated Surveillance System
	TK - Tank
	SMP - Sump
	R - Usually denotes replacement
	NM - Not Monitored

(1) SOURCE: WASTE STORAGE TANK STATUS & LEAK DETECTION CRITERIA document

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TABLE G-3. WEST AREA INACTIVE MISC. UNDERGROUND STORAGE TANKS AND SPECIAL SURV. FACILITIES

INACTIVE - no longer receiving waste transfers

November 30, 1998

<u>FACILITY</u>	<u>LOCATION</u>	<u>RECEIVED WASTE FROM:</u>	<u>(Gallons)</u>	<u>MONITORED</u> <u>BY</u>	<u>REMARKS</u>
216-TY-201	E. of TY Farm	Supernate from T-112	Unknown	NM	Isolated
231-W-151-001	N. of Z Plant	231-Z Floor drains	Unknown	NM	Inactive, last data 1974
231-W-151-002	N. of Z Plant	231-Z Floor drains	Unknown	NM	Inactive, last data 1974
240-S-302	S Farm	240-S-151 DB	8544	CASS/ENRAF	Assumed Leaker EPDA 85-04
241-S-302-A	S Farm	241-S-151 DB	0	CASS/FIC *	Assumed Leaker TF-EFS-90-042
			* FIC in Intrusion mode		Partially filled with grout 2/91, determined still assumed leaker after leak test
241-S-302-B	S Farm	S Encasements	Unknown	NM	Isolated 1985 (1)
241-SX-302	SX Farm	SX-151 DB, 151 TB	Unknown	NM	Isolated 1987
241-SX-304	SX Farm	SX-152 Transfer Box, SX-151 DB	Unknown	NM	Isolated 1985 (1)
241-T-301	T Farm	DB T-151, -151, -153, -252	Unknown	NM	Isolated 1985 (241-T-301B)
241-TX-302	TX Farm	TX-153 DB	Unknown	NM	Isolated 1985 (1)
241-TX-302-X-B	TX Farm	TX Encasements	Unknown	NM	Isolated 1985 (1)
241-TX-302-B	TX Farm	TX-155 DB	1600	CASS/MT	New MT installed 7/16/93
241-TX-302B(R)	E. of TX Farm	TX-155 DB	Unknown	NM	Isolated
241-TY-302-A	TY Farm	TX-153 DB	Unknown	NM	Isolated 1985 (1)
241-TY-302-B	TY Farm	TY Encasements	Unknown	NM	Isolated 1985 (1)
241-Z-8	E. of Z Plant	Recuplex waste	Unknown	NM	Isolated, 1974, 1975
242-T-135	T Evaporator	T Evaporator	Unknown	NM	Isolated
242-TA-R1	T Evaporator	Z Plant waste	Unknown	NM	Isolated
243-S-TK-1	N. of S Farm	Pers. Decon. Facility	Unknown	NM	Isolated
244-U-TK/SMP	U Farm	DCRT - Receives from several farms	Unknown	NM	Not yet in use
244-TXR VAULT	TX Farm	Transfer lines	Unknown	NM	Interim Stabilized, MT removed 1984 (1)
244-TXR-TK/SMP-001	TX Farm	Transfer lines	Unknown	NM	Interim Stabilized, MT removed 1984 (1)
244-TXR-TK/SMP-002	TX Farm	Transfer lines	Unknown	NM	Interim Stabilized, MT removed 1984 (1)
244-TXR-TK/SMP-003	TX Farm	Transfer lines	Unknown	NM	Interim Stabilized, MT removed 1984 (1)
270-W	SE of U Plant	Condensate from U-221	Unknown	NM	Isolated 1970
361-T-TANK	T Plant	Drainage from T-Plant	Unknown	NM	Isolated 1985 (1)
361-U-TANK	U Plant	Drainage from U-Plant	Unknown	NM	Interim Stabilized, MT removed 1984 (1)

Total West Area inactive facilities 27

LEGEND:

- DB - Diversion Box, TB - Transfer Box
- DCRT - Double-Contained Receiver Tank
- TK - Tank
- SMP - Bump
- R - Usually denotes Replacement
- FIC - Surface Level Monitoring Device
- MT - Manual Tape
- O/S - Out of Service
- CASS - Computer Automated Surveillance System
- NM - Not Monitored
- ENRAF - Surface Level Monitoring Device

(1) SOURCE: WASTE STORAGE TANK STATUS & LEAK DETECTION CRITERIA document

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APPENDIX H

LEAK VOLUME ESTIMATES

TABLE H-1. SINGLE-SHELL TANK LEAK VOLUME ESTIMATES (Sheet 1 of 5)

November 30, 1998

Tank Number	Date Declared Confirmed or Assumed Leaker (3)	Volume Gallons (2)(4)	Associated KiloCuries 137 cs (10)	Interim Stabilized Date (12)	Leak Estimate	
					Updated	Reference
241-A-103	1987	5500 (9)		06/88	1987	(j)
241-A-104	1975	500 to 2500	0.8 to 1.8 (q)	09/78	1983	(a)(q)
241-A-105 (1)	1963	10000 to 277000	85 to 760 (b)	07/79	1991	(b)(c)
241-AX-102	1988	3000 (9)		08/88	1989	(h)
241-AX-104	1977	-- (7)		08/81	1989	(g)
241-B-101	1974	-- (7)		03/81	1989	(g)
241-B-103	1978	-- (7)		02/85	1989	(g)
241-B-105	1978	-- (7)		12/84	1989	(g)
241-B-107	1980	8000 (9)		03/85	1986	(d)(f)
241-B-110	1981	10000 (9)		03/85	1986	(d)
241-B-111	1978	-- (7)		06/85	1989	(g)
241-B-112	1978	2000		05/85	1989	(g)
241-B-201	1980	1200 (9)		08/81	1984	(e)(f)
241-B-203	1983	300 (9)		06/84	1986	(d)
241-B-204	1984	400 (9)		06/84	1989	(g)
241-BX-101	1972	-- (7)		09/78	1989	(g)
241-BX-102	1971	70000	50 (l)	11/78	1986	(d)
241-BX-108	1974	2500	0.5 (l)	07/79	1986	(d)
241-BX-110	1976	-- (7)		08/85	1989	(g)
241-BX-111	1984 (14)	-- (7)		03/95	1993	(g)(r)
241-BY-103	1973	<5000		11/97	1983	(a)
241-BY-105	1984	-- (7)		N/A	1989	(g)
241-BY-106	1984	-- (7)		N/A	1989	(g)
241-BY-107	1984	15100 (9)		07/79	1989	(g)
241-BY-108	1972	<5000		02/85	1983	(a)
241-C-101	1980	20000 (9)(11)		11/83	1986	(d)
241-C-110	1984	2000		05/95	1989	(g)
241-C-111	1968	5500 (9)		03/84	1989	(g)
241-C-201 (5)	1988	550		03/82	1987	(i)
241-C-202 (5)	1988	450		08/81	1987	(i)
241-C-203	1984	400 (9)		03/82	1986	(d)
241-C-204 (5)	1988	350		09/82	1987	(i)
241-S-104	1968	24000 (9)		12/84	1989	(g)
241-SX-104	1988	6000 (9)		N/A	1988	(k)
241-SX-107	1964	<5000		10/79	1983	(a)
241-SX-108 (6)(15)	1962	2400 to 35000	17 to 140 (m)(q)(u)	08/79	1991	(m)(q)(u)
241-SX-109 (6)(15)	1965	<10000	<40 (n)(u)	05/81	1992	(n)(u)
241-SX-110	1976	5500 (9)		08/79	1989	(g)
241-SX-111 (15)	1974	500 to 2000	0.6 to 2.4 (l)(q)(u)	07/79	1986	(d)(q)(u)
241-SX-112 (15)	1969	30000	40 (l)(u)	07/79	1986	(d)(u)
241-SX-113	1962	15000	8 (l)	11/78	1986	(d)
241-SX-114	1972	-- (7)		07/79	1989	(g)
241-SX-115	1965	50000	21 (o)	09/78	1992	(o)
241-T-101	1992	7500 (9)		04/93	1992	(p)
241-T-103	1974	<1000 (9)		11/83	1989	(g)
241-T-106	1973	115000 (9)	40 (l)	08/81	1986	(d)
241-T-107	1984	-- (7)		05/96	1989	(g)
241-T-108	1974	<1000 (9)		11/78	1980	(f)
241-T-109	1974	<1000 (9)		12/84	1989	(g)
241-T-111	1979, 1994 (13)	<1000 (9)		02/95	1994	(f)(t)
241-TX-105	1977	-- (7)		04/83	1989	(g)
241-TX-107 (6)	1984	2500		10/79	1986	(d)
241-TX-110	1977	-- (7)		04/83	1989	(g)
241-TX-113	1974	-- (7)		04/83	1989	(g)
241-TX-114	1974	-- (7)		04/83	1989	(g)
241-TX-115	1977	-- (7)		09/83	1989	(g)
241-TX-116	1977	-- (7)		04/83	1989	(g)
241-TX-117	1977	-- (7)		03/83	1989	(g)
241-TY-101	1973	<1000 (9)		04/83	1980	(f)
241-TY-103	1973	3000	0.7 (l)	02/83	1986	(d)
241-TY-104	1981	1400 (9)		11/83	1986	(d)
241-TY-105	1960	35000	4 (l)	02/83	1986	(d)
241-TY-106	1959	20000	2 (l)	11/78	1986	(d)
241-U-101	1959	30000	20 (l)	09/79	1986	(d)
241-U-104	1961	55000	0.09 (l)	10/78	1986	(d)
241-U-110	1975	5000 to 8100 (9)	0.05 (q)	12/84	1986	(d)(q)
241-U-112	1980	8500 (9)		09/79	1986	(d)
67 Tanks		<750,000 - 1,050,000 (8)				

N/A = not applicable (not yet interim stabilized)

TABLE H-1. SINGLE-SHELL LEAK VOLUME ESTIMATES
(Sheet 2 of 5)

Footnotes:

- (1) Current estimates [see reference(b)] are that 610 Kgallons of cooling water was added to Tank 241-A-105 from November 1970 to December 1978 to aid in evaporative cooling. In accordance with Dangerous Waste Regulations [Washington Administrative Code 173-303-070 (2)(a)(ii), as amended, Washington State Department of Ecology, 1990, Olympia, Washington], any of this cooling water that has been added and subsequently leaked from the tank must be classified as a waste and should be included in the total leak volume. In August 1991, the leak volume estimate for this tank was updated in accordance with the WAC regulations. Previous estimates excluded the cooling water leaks from the total leak volume estimates because the waste content (concentration) in the cooling water which leaked should be much less than the original liquid waste in the tank (the sludge is relatively insoluble). The total leak volume estimate in this report (10 Kgallons to 277 Kgallons) is based on the following (see References):

1. Reference (b) contains an estimate of 5 Kgallons to 15 Kgallons for the initial leak prior to August 1968.
2. Reference (b) contains an estimate of 5 Kgallons to 30 Kgallons for the leak while the tank was being sluiced from August 1968 to November 1970.
3. Reference (b) contains an estimate of 610 Kgallons of cooling water added to the tank from November 1970 to December 1978 but it was estimated that the leakage was small during this period. This reference contains the statement "Sufficient heat was generated in the tank to evaporate most, and perhaps nearly all, of this water." This results in a low estimate of zero gallons leakage from November 1970 to December 1978.
4. Reference (c) contains an estimate the 378 to 410 Kgallons evaporated out of the tank from November 1970 to December 1978. Subtracting the minimum evaporation estimate from the cooling water added estimate provides a range from 0 to 232 Kgallons of cooling water leakage from November 1970 to December 1978.

	<u>Low Estimate</u>	<u>High Estimate</u>
Prior to August 1968	5,000	15,000
August 1968 to November 1970	5,000	30,000
November 1970 to December 1978	0	232,000
Totals	10,000	277,000

- (2) These leak volume estimates do not include (with some exceptions), such things as: (a) cooling/raw water leaks, (b) intrusions (rain infiltration) and subsequent leaks, (c) leaks inside the tank farm but not through the tank liner (surface leaks, pipeline leaks, leaks at the joint for the overflow or fill lines, etc.), and (d) leaks from catch tanks, diversion boxes, encasements, etc.
- (3) In many cases, a leak was suspected long before it was identified or confirmed. For example, reference (d) shows that Tank 241-U-104 was suspected of leaking in 1956. The leak was "confirmed" in 1961. This report lists the "assumed leaker" date of 1961. Using present standards, Tank 241-U-104 would have been declared an assumed leaker in 1956. In 1984, the criteria designations of "suspected leaker," "questionable integrity," "confirmed leaker," "declared leaker," "borderline" and "dormant," were merged into one category now reported as "assumed leaker." See reference (f) for explanation of when, how long, and how fast some of the tanks leaked. It is highly likely that there have been undetected leaks from single-shell tanks because of the nature of their design and instrumentation.
- (4) There has been an effort in the past few years to re-evaluate these leak volume estimates; however, the activity is not currently funded.

TABLE H-1. SINGLE-SHELL TANK LEAK VOLUME ESTIMATES
(Sheet 3 of 5)

- (5) The leak volume estimate date for these tank is before the "declared leaker" date because the tank was in a "suspected leaker" or "questionable integrity" status; however, a leak volume had been estimated prior to the tank being reclassified.
- (6) The increasing radiation levels in drywells and laterals associated with these three tanks could be indicative of a continuing leak or movement of existing radio nuclides in the soil. There is no conclusive way to confirm these observations.
- (7) Methods were used to estimate the leak volumes from these 19 tanks based on the assumption that their cumulative leakage is approximately the same as for 18 of the 24 tanks identified in footnote (9). For more details see reference (g). The total leak volume estimate for these tanks is 150 Kgallons (rounded to the nearest Kgallons), for an average of approximately 8 Kgallons for each of 19 tanks.
- (8) The total has been rounded to the nearest 50 Kgallons. Upper bound values were used in many cases in developing these estimates. It is likely that some of these tanks have not actually leaked.
- (9) Leak volume estimate is based solely on observed liquid level decreases in these tanks. This is considered to be the most accurate method for estimating leak volumes.
- (10) The curie content shown is as listed in the reference document and is not decayed to a consistent date; therefore, a cumulative total is inappropriate.
- (11) Tank 241-C-101 experienced a liquid level decrease in the late 1960s and was taken out of service and pumped to a "minimum heel" in December 1969. In 1970, the tank was classified as a "questionable integrity" tank. Liquid level data show decreases in level throughout the 1970s and the tank was saltwell pumped during the 1970s, ending in April 1979. The tank was reclassified as a "confirmed leaker" in January 1980. See references (q) and (s); refer to reference (s) for information on the potential for there to have been leaks from other C-farm tanks (specifically, C-102, C-103, and C-109).
- (12) These dates indicate when the tanks were declared to be interim stabilized. In some cases, the official interim stabilization documents were issued at a later date. Also, in some cases, the field work associated with interim stabilization was completed at an earlier date.
- (13) Tank T-111 was declared an assumed re-leaker on February 28, 1994, due to a decreasing trend in surface level measurement. This tank was pumped, and interim stabilization completed on February 22, 1995.
- (14) Tank BX-111 was declared an assumed re-leaker in April 1993. Preparations for pumping were delayed, following an administrative hold place on all tank farm operations in August 1993. Pumping resumed and the tank was declared interim stabilized on March 15, 1995.
- (15) The leak volume and curie release estimates on SX-108, SX-109, SX-111, and SX-112 have been re-evaluated using a Historical Leak Model [see reference (u)]. In general, the model estimates are much higher than the values listed in the table, both for volume and curies released. The values listed in the table do not reflect this revised estimate because, "In particular, it is worth emphasizing that this report was never meant to be a definitive update for the leak baseline at the Hanford Site. It was rather meant to be an attempt to view the issue of leak inventories with a new and different methodology." (This quote is from the first page of the referenced report). Therefore, an uncertainty analysis to determine the applicability of this methodology is currently in progress.

TABLE H-1. SINGLE-SHELL TANK LEAK VOLUME ESTIMATES
(Sheet 4 of 5)

References:

- (a) Murthy, K.S., et al, June 1983, *Assessment of Single-Shell Tank Residual Liquid Issues at Hanford Site, Washington*, PNL-4688, Pacific Northwest Laboratory, Richland, Washington.
- (b) WHC, 1991a, *Tank 241-A-105 Leak Assessment*, WHC-MR-0264, Westinghouse Hanford Company, Richland, Washington.
- (c) WHC, 1991b, *Tank 241-A-105 Evaporation Estimate 1970 Through 1978*, WHC-EP-0410, Westinghouse Hanford Company, Richland, Washington.
- (d) Smith, D. A., January 1986, *Single-Shell Tank Isolation Safety Analysis Report*, SD-WM-SAR-006, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- (e) McCann, D. C., and T. S. Vail, September 1984, *Waste Status Summary*, RHO-RE-SR-14, Rockwell Hanford Operations, Richland, Washington.
- (f) Catlin, R. J., March 1980, *Assessment of the Surveillance Program of the High-Level Waste Storage Tanks at Hanford*, Hanford Engineering Development Laboratory, Richland, Washington.
- (g) Baumhardt, R. J., May 15, 1989, Letter to R. E. Gerton, U.S. Department of Energy-Richland Operations Office, *Single-Shell Tank Leak Volumes*, 8901832B R1, Westinghouse Hanford Company, Richland, Washington.
- (h) WHC, 1990a, Occurrence Report, *Surface Level Measurement Decrease in Single-Shell Tank 241-AX-102*, WHC-UO-89-023-TF-05, Westinghouse Hanford Company, Richland, Washington.
- (i) Groth, D. R., July 1, 1987, Internal Memorandum to R. J. Baumhardt, *Liquid Level Losses in Tanks 241-C-201, -202 and -204*, 65950-87-517, Westinghouse Hanford Company, Richland, Washington.
- (j) Groth, D. R. and G. C. Owens, May 15, 1987, Internal Memorandum to J. H. Roecker, *Tank 103-A Integrity Evaluation*, Westinghouse Hanford Company, Richland, Washington.
- (k) Campbell, G. D., July 8, 1988, Internal Memorandum to R. K. Welty, *Engineering Investigation: Interstitial Liquid Level Decrease in Tank 241-SX-104*, 13331-88-416, Westinghouse Hanford Company, Richland, Washington.
- (l) ERDA, 1975, *Final Environmental Statement Waste Management Operations, Hanford Reservation, Richland, Washington*, ERDA-1538, 2 vols., U.S. Energy Research and Development Administration, Washington, D.C.
- (m) WHC, 1992a, *Tank 241-SX-108 Leak Assessment*, WHC-MR-0300, Westinghouse Hanford Company, Richland, Washington.
- (n) WHC, 1992b, *Tank 241-SX-109 Leak Assessment*, WHC-MR-0301, Westinghouse Hanford Company, Richland, Washington.
- (o) WHC, 1992c, *Tank 241-SX-115 Leak Assessment*, WHC-MR-0302, Westinghouse Hanford Company, Richland, Washington.

TABLE H-1. SINGLE-SHELL TANK LEAK VOLUME ESTIMATES

(Sheet 5 of 5)

- (p) WHC, 1992d, Occurrence Report, *Apparent Decrease in Liquid Level in Single Shell Underground Storage Tank 241-T-101, Leak Suspected; Investigation Continuing*, RL-WHC-TANKFARM-1992-0073, Westinghouse Hanford Company, Richland, Washington.
- (q) WHC, 1990b, *A History of the 200 Area Tank Farms*, WHC-MR-0132, Westinghouse Hanford Company, Richland, Washington.
- (r) WHC, 1993, Occurrence Report, *Single-Shell Underground Waste Storage Tank 241-BX-111 Surface Level Decrease and Change From Steady State Condition*, RL-WHC-TANKFARM-1993-0035, Westinghouse Hanford Company, Richland, Washington.
- (s) WHC, 1993a, *Assessment of Unsaturated Zone Radionuclide Contamination Around Single-Shell Tanks 241-C-105 and 241-C-106*, WHC-SD-EN-TI-185, REV OA, Westinghouse Hanford Company, Richland, Washington.
- (t) WHC, 1994, Occurrence Report, *Apparent Liquid Level Decrease in Single Shell Underground Storage Tank 241-T-111; Declared an Assumed Re-Leaker*, RL-WHC-TANKFARM-1994-0009, Westinghouse Hanford Company, Richland, Washington.
- (u) HNF, 1998, Agnew, S. F. and R. A. Corbin, August 1998, *Analysis of SX Farm Leak Histories - Historical Leak Model*, (HLM), HNF-3233, Rev. 0, Los Alamos National Laboratory, Los Alamos, New Mexico

APPENDIX I

INTERIM STABILIZATION STATUS CONTROLLED, CLEAN, AND STABLE STATUS

TABLE I-1. SINGLE-SHELL TANKS INTERIM STABILIZATION STATUS (Sheet 1 of 3)

November 30, 1998

Tank Number	Tank Integrity	Interim Stabil. Date (1)	Stabil. Method	Tank Number	Tank Integrity	Interim Stabil. Date (1)	Stabil. Method	Tank Number	Tank Integrity	Interim Stabil. Date (1)	Stabil. Method
A-101	SOUND	N/A		C-101	ASMD LKR	11/83	AR	T-108	ASMD LKR	11/78	AR
A-102	SOUND	08/89	SN	C-102	SOUND	09/85	JET	T-109	ASMD LKR	12/84	AR
A-103	ASMD LKR	08/88	AR	C-103	SOUND	N/A		T-110	SOUND	N/A	
A-104	ASMD LKR	09/78	AR	C-104	SOUND	09/89	SN	T-111	ASMD LKR	02/95	JET
A-105	ASMD LKR	07/79	AR	C-105	SOUND	10/95	AR (5)	T-112	SOUND	03/81	AR(2)(3)
A-106	SOUND	08/82	AR	C-106	SOUND	N/A		T-201	SOUND	04/81	AR (3)
AX-101	SOUND	N/A		C-107	SOUND	09/85	JET	T-202	SOUND	08/81	AR
AX-102	ASMD LKR	09/88	SN	C-108	SOUND	03/84	AR	T-203	SOUND	04/81	AR
AX-103	SOUND	08/87	AR	C-109	SOUND	11/83	AR	T-204	SOUND	08/81	AR
AX-104	ASMD LKR	08/81	AR	C-110	ASMD LKR	05/95	JET	TX-101	SOUND	02/84	AR
B-101	ASMD LKR	03/81	SN	C-111	ASMD LKR	03/84	SN	TX-102	SOUND	04/83	JET
B-102	SOUND	08/85	SN	C-112	SOUND	09/90	AR	TX-103	SOUND	08/83	JET
B-103	ASMD LKR	02/85	SN	C-201	ASMD LKR	03/82	AR	TX-104	SOUND	09/79	SN
B-104	SOUND	06/85	SN	C-202	ASMD LKR	08/81	AR	TX-105	ASMD LKR	04/83	JET
B-105	ASMD LKR	12/84	AR	C-203	ASMD LKR	03/82	AR	TX-106	SOUND	06/83	JET
B-106	SOUND	03/85	SN	C-204	ASMD LKR	09/82	AR	TX-107	ASMD LKR	10/79	AR
B-107	ASMD LKR	03/85	SN	S-101	SOUND	N/A		TX-108	SOUND	03/83	JET
B-108	SOUND	05/85	SN	S-102	SOUND	N/A		TX-109	SOUND	04/83	JET
B-109	SOUND	04/85	SN	S-103	SOUND	N/A		TX-110	ASMD LKR	04/83	JET
B-110	ASMD LKR	12/84	AR	S-104	ASMD LKR	12/84	AR	TX-111	SOUND	04/83	JET
B-111	ASMD LKR	06/85	SN	S-105	SOUND	09/88	JET	TX-112	SOUND	04/83	JET
B-112	ASMD LKR	06/85	SN	S-106	SOUND	N/A		TX-113	ASMD LKR	04/83	JET
B-201	ASMD LKR	08/81	AR (3)	S-107	SOUND	N/A		TX-114	ASMD LKR	04/83	JET
B-202	SOUND	05/85	AR	S-108	SOUND	12/96	JET (7)	TX-115	ASMD LKR	08/83	JET
B-203	ASMD LKR	06/84	AR	S-109	SOUND	N/A		TX-116	ASMD LKR	04/83	JET
B-204	ASMD LKR	06/84	AR	S-110	SOUND	01/97	JET (8)	TX-117	ASMD LKR	03/83	JET
BX-101	ASMD LKR	09/78	AR	S-111	SOUND	N/A		TX-118	SOUND	04/83	JET
BX-102	ASMD LKR	11/78	AR	S-112	SOUND	N/A		TY-101	ASMD LKR	04/83	JET
BX-103	SOUND	11/83	AR(2)	SX-101	SOUND	N/A		TY-102	SOUND	09/79	AR
BX-104	SOUND	09/89	SN	SX-102	SOUND	N/A		TY-103	ASMD LKR	02/83	JET
BX-105	SOUND	03/81	SN	SX-103	SOUND	N/A		TY-104	ASMD LKR	11/83	AR
BX-106	SOUND	07/85	SN	SX-104	ASMD LKR	N/A		TY-105	ASMD LKR	02/83	JET
BX-107	SOUND	09/90	JET	SX-105	SOUND	N/A		TY-106	ASMD LKR	11/78	AR
BX-108	ASMD LKR	07/79	SN	SX-106	SOUND	N/A		U-101	ASMD LKR	09/79	AR
BX-109	SOUND	09/90	JET	SX-107	ASMD LKR	10/79	AR	U-102	SOUND	N/A	
BX-110	ASMD LKR	08/85	SN (4)	SX-108	ASMD LKR	08/79	AR	U-103	SOUND	N/A	
BX-111	ASMD LKR	03/95	JET	SX-109	ASMD LKR	06/81	AR	U-104	ASMD LKR	10/78	AR
BX-112	SOUND	09/90	JET	SX-110	ASMD LKR	08/79	AR	U-105	SOUND	N/A	
BY-101	SOUND	05/84	JET	SX-111	ASMD LKR	07/79	SN	U-106	SOUND	N/A	
BY-102	SOUND	04/85	JET	SX-112	ASMD LKR	07/79	AR	U-107	SOUND	N/A	
BY-103	ASMD LKR	11/97	JET(10)	SX-113	ASMD LKR	11/78	AR	U-108	SOUND	N/A	
BY-104	SOUND	01/85	JET	SX-114	ASMD LKR	07/79	AR	U-109	SOUND	N/A	
BY-105	ASMD LKR	N/A		SX-115	ASMD LKR	09/78	AR	U-110	ASMD LKR	12/84	AR
BY-106	ASMD LKR	N/A		T-101	ASMD LKR	04/83	SN	U-111	SOUND	N/A	
BY-107	ASMD LKR	07/79	JET	T-102	SOUND	03/81	AR(2)(3)	U-112	ASMD LKR	09/79	AR
BY-108	ASMD LKR	02/85	JET	T-103	ASMD LKR	11/83	AR	U-201	SOUND	08/79	AR
BY-109	SOUND	07/87	JET(9)	T-104	SOUND	N/A		U-202	SOUND	08/79	SN
BY-110	SOUND	01/85	JET	T-105	SOUND	06/87	AR	U-203	SOUND	08/79	AR
BY-111	SOUND	01/85	JET	T-106	ASMD LKR	08/81	AR	U-204	SOUND	08/79	SN
BY-112	SOUND	06/84	JET	T-107	ASMD LKR	05/86	JET				

LEGEND:

AR = Administratively interim stabilized
 JET = Saltwell jet pumped to remove drainable interstitial liquid
 SN = Supernate pumped (Non-Jet pumped)
 N/A = Not yet interim stabilized
 ASMD LKR = Assumed Leaker

Interim Stabilized Tanks	119
Not Yet Interim Stabilized	30
Total Single-Shell Tanks	149

TABLE I-1. SINGLE-SHELL TANKS INTERIM STABILIZATION STATUS
(sheet 2 of 3)

Footnotes:

- (1) These dates indicate when the tanks were actually interim stabilized. In some cases, the official interim stabilization documents were issued at a later date.
- (2) Originally, seven tanks (B-104, B-110, B-111, BX-103, T-102, and T-112) did not meet current established supernatant and interstitial liquid interim stabilization criteria, but did meet the criteria in existence when they were declared interim stabilized.

B-110, B-111, U-110 were determined to have met current interim stabilization criteria, per WHC-SD-WM-ER-516-REV 0, "Interim Stabilization Status of SSTs B-104, B-110, B-111, T-102, T-112, and U-110," and WHC-SD-WM-ER-518-REV 0, "Investigation of Liquid Intrusion in 241-BX-103," both dated October 5, 1995.

B-104, BX-103, T-102, T-112 have been determined to meet current interim stabilization criteria as of September 30, 1996, per memo 9654456, J. H. Wicks to Dr. J. K. McClusky, DOE-RL.

B-202 was determined to no longer meet the current established criteria for 200-series tanks due to a steady increase in the surface level indicating an ongoing intrusion based on a comparison of in-tank videos and subsequent evaluation in March 1996.

- (3) Original Interim Stabilization data are missing on four tanks: B-201, T-102, T-112, and T-201.
- (4) BX-110 was interim stabilized by Supernate Pumping in August 1985. Jet pumping began in December 1993 and soon stopped because of equipment failure. Due to low net volume pumped, major equipment failure, and ALARA, it was decided jet pumping would not resume. An in-tank video was taken in October 1994. Re-evaluation after review of the video indicated 1.5 Kgallons of waste was pumped. (Almost 3 Kgallons of water flushes were needed to produce 1.5 Kgallons tank waste.)
- (5) C-105 was interim stabilized administratively on October 30, 1995. No jet pumping occurred in this tank, nor does interstitial liquid level data exist for this tank. There are no diptubes or LOWs installed. Approximately 12 Kgallons of liquid waste was evaporated between May 1993 and October 1995. An in-tank video taken August 30, 1995, revealed a shallow supernatant pool surrounded by a 5-8 foot solids waste shore. The volume of supernate is estimated as 2 Kgallons. The tank currently meets the established criteria for declaring single-shell tanks Interim Stabilized.
- (6) T-107 was interim stabilized by Jet Pumping in May 1996. Pumping was completed in March, and an in-tank video taken in May showed no supernate visible on the surface. The surface has an irregular contour of mostly sludge, and the elevation differences between high and low points appear to be about four inches.
- (7) S-108 was interim stabilized by Jet Pumping in December 1996. Pumping was completed in September and an in-tank video taken in December showed no supernate visible on the surface of the waste, which appears to be saltcake. The video shows a relatively level surface with some caving and crowning. Total waste is 448.7 Kgallons, with drainable liquids 4.0 Kgallons and no pumpable liquids.
- (8) S-110 was interim stabilized by Jet Pumping in January 1997. Pumping was completed in July 1996, and an in-tank video taken in December showed no supernate visible on the surface of the waste, which appears to be saltcake. The level is not consistent and there appears to have been some caving and crowning. Total waste is 389.0 Kgallons, with drainable liquids 29.8 Kgallons and pumpable liquids 23.4 Kgallons.
- (9) BY-109 was interim stabilized by Jet Pumping in July 1997. Pumping was completed in May 1997, and an in-tank video taken in June indicated there is a relatively uniform, slightly concave, crusty/cracked contour over most of the surface with no visible supernate. Total waste is 290.0 Kgallons, with drainable liquids 36.7 Kgallons, and pumpable liquids 20.3 Kgallons.

TABLE I-1. SINGLE-SHELL TANKS INTERIM STABILIZATION STATUS
(sheet 3 of 3)

- (10) BY-103 was interim stabilized in November 1997, after completion of jet pumping in September. An in-tank video taken in February 1997 showed no visible surface liquid and no evidence of an intrusion. The waste was dry and flaky. Dried, caked waste was suspended from many of the pipes and pieces of process equipment. The overall surface of the waste seemed to slump slightly towards the center of the tank. Total waste is 414 Kgallons, with drainable liquids 38.3 Kgallons, and pumpable liquids 31.9 Kgallons.

**TABLE I-2. TRI-PARTY AGREEMENT
SINGLE-SHELL TANK INTERIM STABILIZATION SCHEDULE
November 30, 1998**

As part of the Controlled, Clean, and Stable mission, the Single-Shell Tank Interim Stabilization Project goal is to mitigate the risk to the environment from a leak release from aging SSTs, by removing as much of the drainable liquid as practical, for safe storage prior to full waste retrieval.

New TPA milestones were negotiated effective September 23, 1996, to allow greater flexibility in the sequencing of tanks, in light of the latest technical information regarding tank waste safety status and watch list concerns.

Milestone	Description	Due Date	Actual Date	Comments
M-41-20	Start Interim Stabilization of 4 Single-Shell Tanks	9/30/96	3/24/96	S-108, S-110, T-104, and T-107 started.
M-41-21	Start Interim Stabilization of 2 Single-Shell Tanks	5/31/97 (1)	5/12/97	BY-109 started 9/10/96; T-110 started 5/12/97
M-41-22	Start Interim Stabilization of 6 Single-Shell Tanks	9/30/97 (2)(4)		BY-103 started 9/29/97, SX-104 started 9/26/97
M-41-23	Start Interim Stabilization of 8 Single-Shell Tanks	3/31/98 (3)(4)		
M-41-24	Start Interim Stabilization of 9 Single-Shell Tanks	9/30/98 (4)		
M-41-25	Start Interim Stabilization of 3 Single-Shell Tanks	3/31/99 (4)		
M-41-26	Start Interim Stabilization of 2 Single-Shell Tanks	9/30/99 (4)		
M-41-27	Complete Saltwell Pumping of Single-Shell Tanks	9/30/00 (4)		
M-41-00	Complete Interim Stabilization of Single-Shell Tanks including Intrusion Prevention	9/30/00 (4)		

- (1) On March 13, 1997, Department of Ecology (Ecology) approved Change Control Form M-41-96-03, extending M-41-21 from March 31 to May 31, 1997.
- (2) Change Control Form M-41-97-01 was sent to Ecology on June 27, 1997; Dispute Resolution invoked on July 16, 1997. This Change Request was denied by the Director of Ecology on February 10, 1998.
- (3) Change Control Form M-41-97-02 was sent to Ecology on December 29, 1997. Dispute Resolution invoked on January 13, 1998. This Change Request was denied by the Director of Ecology on March 10, 1998.
- (4) Path Forward Plan submitted to Ecology on April 15, 1998, projects completion date of September 30, 2004.

TABLE I-3. SINGLE-SHELL TANKS STABILIZATION STATUS SUMMARY

November 30, 1998

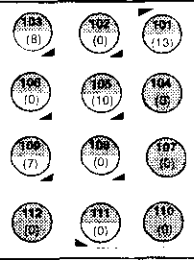
Partial Interim Isolated (PI)	Intrusion Prevention Completed (IP)		Interim Stabilized (IS)	
EAST AREA	EAST AREA	WEST AREA	EAST AREA	WEST AREA
A-101	A-103	S-104	A-102	S-104
A-102	A-104	S-105	A-103	S-105
	A-105		A-104	S-108
AX-101	A-106	SX-107	A-105	S-110
		SX-108	A-106	
BY-102	AX-102	SX-109		SX-107
BY-103	AX-103	SX-110	AX-102	SX-108
BY-105	AX-104	SX-111	AX-103	SX-109
BY-106		SX-112	AX-104	SX-110
BY-109	B-FARM - 16 tanks	SX-113		SX-111
	BX-FARM - 12 tanks	SX-114	B-FARM - 16 tanks	SX-112
C-103		SX-115	BX-FARM - 12 tanks	SX-113
C-105	BY-101			SX-114
C-106	BY-104	T-102	BY-101	SX-115
East Area 11	BY-107	T-103	BY-102	
	BY-108	T-105	BY-103	T-101
WEST AREA	BY-110	T-106	BY-104	T-102
S-101	BY-111	T-108	BY-107	T-103
S-102	BY-112	T-109	BY-108	T-105
S-103		T-112	BY-109	T-106
S-106	C-101	T-201	BY-110	T-107
S-107	C-102	T-202	BY-111	T-108
S-108	C-104	T-203	BY-112	T-109
S-109	C-107	T-204		T-111
S-110	C-108		C-101	T-112
S-111	C-109	TX-FARM - 18 tanks	C-102	T-201
S-112	C-110	TY-FARM - 6 tanks	C-104	T-202
	C-111		C-105	T-203
SX-101	C-112	U-101	C-107	T-204
SX-102	C-201	U-104	C-108	
SX-103	C-202	U-112	C-109	TX-FARM - 18 tanks
SX-104	C-203	U-102	C-110	TY-FARM - 6 tanks
SX-105	C-204	U-202	C-111	
SX-106	East Area 55	U-203	C-112	U-101
		U-204	C-201	U-104
T-101		West Area 53	C-202	U-110
T-104		Total 108	C-203	U-112
T-107			C-204	U-201
T-110			East Area 60	U-202
T-111				U-203
				U-204
U-102	Controlled, Clean, and Stable (CCS)			West Area 59
U-103	EAST AREA	WEST AREA		Total 119
U-105	BX-FARM - 12 Tanks	TX-FARM - 18 tanks		
U-106		TY FARM - 6 tanks		
U-107	East Area 12	West Area 24		
U-108		Total 36		
U-109				
U-110				
U-111				
West Area 29				
Total 40				

Note: CCS activities have been deferred until funding is available.

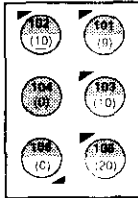
APPENDIX J
CHARACTERIZATION PROGRESS STATUS

200 West

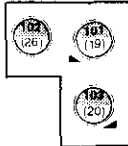
T-Tank Farm



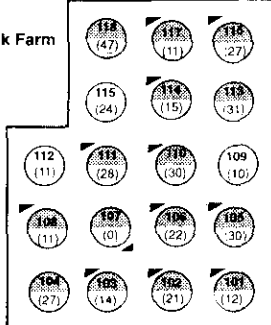
TY-Tank Farm



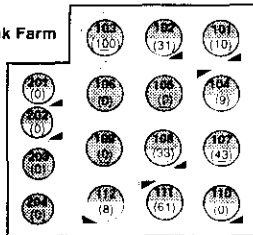
SY-Tank Farm



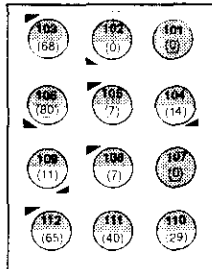
TX-Tank Farm



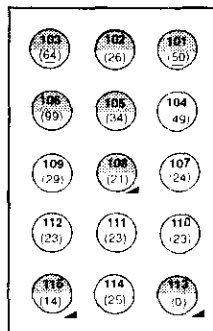
U-Tank Farm



S-Tank Farm

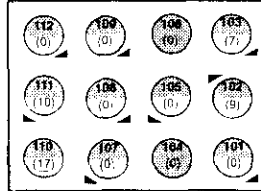


SX-Tank Farm

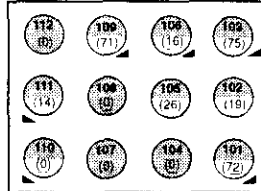


200 East

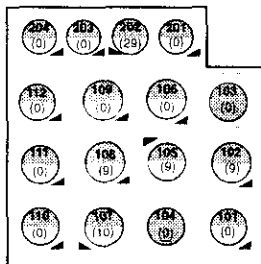
BX-Tank Farm



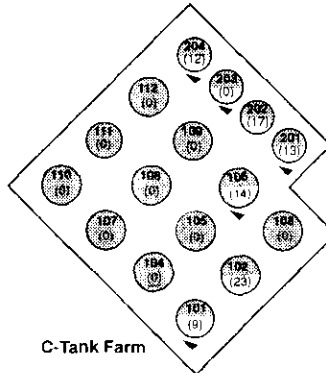
BY-Tank Farm



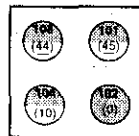
B-Tank Farm



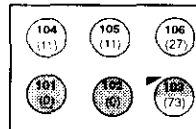
C-Tank Farm



AX-Tank Farm



A-Tank Farm



Hanford Tank Farm Facilities

200 East and West

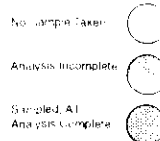
Characterization Progress Status

Vapor Only
Done

Report Under
Review



Watch List
Tanks
High Priority
Tank
Need More
Material

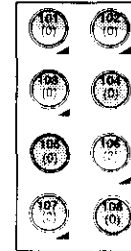


All tanks 70 ft. dia. except 201 series tanks
which are 20 ft. dia. @ 55,000 ga.

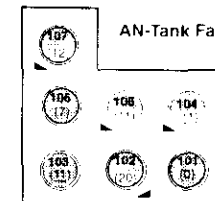
139 Tanks Sampled (Solid Liquids)
25 Tanks Sampled (Vapor Only)
504 Samples Taken
42 Tanks - All Analyses Completed

Status as of DECEMBER 2, 1998

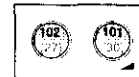
AP-Tank Farm



AN-Tank Farm



AZ-Tank Farm



AY-Tank Farm



AW-Tank Farm

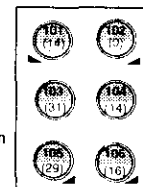


Figure J-1

PG95120163.3-12/2/98

FIGURE J-1. CHARACTERIZATION PROGRESS STATUS CHART LEGEND
(Sheet 2 of 2)

November 30, 1998

200 East/West	The chart divides the two areas.
Tank Farms	Each tank farm is represented by a rough schematic of the tank layout and a heading naming the farm.
Circles	Tanks are depicted by a circle for single-shell tanks and a double circle for double-shell tanks.
Boxes	A thin line box around a tank inside a tank farm denotes "Watch List" status, in concurrence with Table A-1 of this document.
Numbers in Circles	The top number is the tank number. The number in parentheses is a weighted priority number, described in WHC-SD-WM-TA-164, "Tank Waste Characterization Basis." The numbers can be compared to each other to gain appreciation of relative priority: the higher the number, the greater the priority to sample and analyze.
Underlined Numbers	If a number in parenthesis is underlined, it is denoted as a "Characterization Basis Tank," as described in WHC-SD-WM-TA-164, "Tank Waste Characterization Basis." These are key tanks taken from the priority list that are of principal interest to the Characterization Program.
Circle Shading	The shading in the circle indicates the degree to which sampling and analysis are complete per requirements described in applicable Data Quality Objectives (DQOs). If blank, no characterization sampling has taken place. If fully shaded, the sampling and analysis are complete for each DQO applicable to that tank. Tanks in which characterization has begun but is not complete are designated by being half shaded.
Corner Triangles	Small triangles near a tank circle give further information on half-shaded tanks. Upper left corner triangles indicate that vapor samples have been taken from the tank. Lower left-hand corner triangles indicate that the tank has been sampled, analyzed, and a formal report has been written on the condensed phase sampling. Further status of the tank will be determined after review of the report is complete. Lower right-hand corner triangles indicate that some review has been completed and it has been determined that more sampling is needed to resolve the DQO requirements. Absence of triangles from a half shaded tank indicates recent condensed phase sampling.

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H. Calley	EM-38	Cloverleaf Bldg.
Raymond Greenberg	EM-38	Cloverleaf Bldg.
Kenneth Lang	EM-36	Cloverleaf Bldg.
Ralph Lightener	EM-38	Cloverleaf Bldg.
C. O'Dell	EM-4	FORS/6E-034

Robert Pierson, Chief

R. Stanley

Ed Bricker

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Mike Leonard

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R. J. Roberts

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1 R. K. Welty
409 S. 41st Ave
West Richland, WA 99353

1	<u>BAI</u>	
	R. T. Winward	A2-22
1	<u>Jacobs Engineering Group, Inc.</u>	
	Ruth Schreiber	B2-05

2	<u>MACTEC - Meier Associates, LLC</u>	
	J. D. Bingham	R2-11
	T. E. Jones	H6-12
2	<u>MACTEC - ERS</u>	
	J. F. Bertsch	B1-42
	J. R. Brodeur	B1-42
1	<u>MACTEC</u>	
	S. M. Blacker	R3-75
1	<u>General Accounting Office</u>	
	C. R. Abraham	A1-80
2	<u>Washington State Department of Ecology</u>	
	Tony Valero	B5-18
	Library	B5-18
1	<u>U. S. Environmental Protection Agency</u>	
	D. R. Sherwood	B5-01
22	<u>U. S. Department of Energy-Richland Operations Office</u>	
	S. R. Brechbill	A4-52
	D. C. Bryson	S7-41
	J. M. Clark	S7-54
	J. J. Davis	A0-21
	J. A. Frey	K8-50
	R. G. Harwood	S7-54
	R. L. Higgins	S7-53
	R. D. Hildebrand	H0-12
	D. H. Irby	S7-54
	J. E. Kinzer	S7-50
	C. Pacheco	S7-54
	T. E. Olds	A7-75
	S. H. Pfaff	S7-50
	G. M. Ramin	A2-22
	G. W. Rosenwald	S7-54
	M. J. Royack	S7-54
	A. B. Sidpara	S7-53
	R. A. Stolberg	A4-81
	K. G. Wade	S7-53
	D. J. Williams	S7-41
	D. D. Wodrich	S7-50
	Reading Room	H2-53
9	<u>Pacific National Northwest Laboratories</u>	
	S. A. Bryan	P7-25
	T. A. Ferryman	K5-12
	R. E. Gephart	K9-76
	S. A. Hartley	K5-12
	J. L. Huckaby	K6-80
	C. M. King	P7-25
	A. F. Noonan	K9-91
	B. E. Opitz	K6-75

L. A. Smyser A0-21

125

Fluor Daniel, Inc., and Affiliated Companies

D. I. Allen	R2-50
D. G. Baide	S5-05
R. W. Bechtol	A3-05
D. B. Bechtold	T6-07
L. Bedford	R2-84
M. V. Berriochoa	B3-30
T. M. Blaak	S5-13
H. L. Boston	G3-21
V. C. Boyles	R2-11
C. B. Bryan	T4-07
N. K. Butler	R3-01
K. G. Carothers	R2-11
R. J. Cash	S7-14
W. L. Cowley	R1-49
C. Defigh-Price	R2-12
D. K. DeFord	S7-20
M. P. Delozier	R2-58
M. L. Dexter (10)	R1-51
R. A. Dodd	S5-07
J. G. Douglas	B4-51
K. A. Elsethagen	S5-03
A. C. Etheridge	H7-07
S. D. Estey	R2-11
K. D. Fowler	R2-11
G. R. Franz	S7-40
G. T. Frater	K9-46
L. A. Gaddis	H5-57
K. A. Gasper	A3-03
J. E. Geary	S6-71
T. C. Geer	R1-43
M. S. Gerber	B3-26
B. C. Gooding	T4-01
D. R. Groth	T4-15
R. D. Gustavson	R2-54
M. D. Guthrie	S6-72
J. C. Guyette	S7-40
D. B. Hagmann	R2-89
B. K. Hampton	S7-40
B. M. Hanlon (10)	T4-08
G. N. Hanson	S5-07
W.M. Harty Jr.	S5-13
D.C. Hedengren	R2-11
B. A. Higley	H5-49
K. M. Hodgson	R2-11
J. L. Homan	R3-25
G. P. Hopkins	S5-03
W. G. Hopkinson	R2-50
S. E. Hulsey	S5-12
M. N. Islam	R1-43
O. M. Jaka	S5-12
P. Jennings	R2-84
R. D. Gensen	G3-21
G. D. Johnson	S7-14
J. Kalia	R1-43

R. A. Kirkbride	R3-73
P. F. Kison	T4-07
N. W. Kirch	R2-11
J. S. Konyu	R2-88
J. G. Kristofzski	S7-01
M. J. Kupfer	H5-49
M. A. Lane	S2-47
M. D. LeClair	R3-75
J. A. Lechelt	R2-11
G. T. MacLean	R3-73
D. J. McCain	R2-12
M. A. McLaughlin	H8-67
W. H. Meader	H8-66
P. J. Morgan (2)	S7-40
M. A. Payne	R2-58
L. T. Pedersen, Jr.	R1-56
R. E. Pohto	R2-84
R. S. Popielarczyk	S7-01
R. L. Powers	S5-13
T. B. Powers	R3-15
C. J. Rice	R2-50
R. E. Raymond (2)	R2-38
D. S. Rewinkel	S7-40
W. E. Ross	S7-84
K. Sathyanarayana	H0-34
D. J. Saueressig	S8-05
J. S. Schofield	S7-12
E. B. Schwenk, Jr.	L6-38
N. J. Scott-Proctor	S5-01
J. E. Shapley	B4-46
J. P. Shearer	H0-20
D. H. Shuford	S7-03
E. R. Siciliano	B4-43
J. N. Strobe	R2-11
R. R. Thompson	R2-12
A. M. Umek	S7-40
J. E. Van Beek	S2-48
J. A. Voogd	H6-37
A. B. Webb	R1-44
K. A. White	S5-13
A. E. Young (6)	R1-10
F. A. Zak	R3-01
Central Files	B1-07
200 West Shift Office	T4-00
200 East Shift Office	S5-04
Environmental	
Data Mgmt Center (2)	H6-08
Unified Dose Assessment	
Center (UDAC)	A0-20
Document Processing Center	A3-94